The Commentary on Plato's Passage from the Eighth Book of the *Republic* concerning the Republic's Mutation through the Fatal Number

The Exposition of Marsilio Ficino concerning the Nuptial Number in Book 8 of the *Republic*

For a long time the prodigious enigmas in the preceding chapter [i.e., 546A–D] have terrified us and other Platonists from devoting ourselves to their explication. The enigmas I will deal with first, however, are those that have struck me, having thought about it for a long time, as very certainly interpretable. Eventually, I will append those I can very probably explain and ignore those that I cannot. For Plato himself did not wish certain enigmas to be unfolded. Indeed, discourse inexplicable to men deservedly he attributed to the Muses, but to the Muses at play, for there is something in a fable which is hidden from us.

Chapter 1. On circles, conversions, revolutions; and by what opportunity the lower may be led by the higher.

At the onset he names the substances themselves of the world spheres (but principally of the celestial spheres) "ciclos," that is, circles or rings.[1] Then he calls the absolutely circular motions, which the celestial spheres and any of the fixed stars as it were complete around their own centers, "peritropai," that is, conversions.[2] Moreover, the circuits, which all the planets enact in addition from east to west and back to the east or in alternation, and likewise from south to north and the reverse, again forwards and backwards, upwards and downwards—these he calls "periphorai," that is, revolutions or ambits.[3] Such planetary revolutions or ambits are ruled by the spherical conversions and accord with things earthly. The planetary revolutions also accord with and fit the spherical conversions to things earthly.[4] Thus life and fertility and [their] opposites among things earthly are measured by way of things heavenly, but according to the law that declares that particular species of plants or animals are subjected to and guided by particular measures. For one revolution of Saturn (or one

Commentarius in Locum Platonis ex Octavo Libro de *Re Publica* de Mutatione Rei Publicae per Numerum Fatalem*

[149r][1414] Expositio Marsilii Ficini[1] Circa Numerum Nuptialem in VIII de *Re Publica*.

Aenigmata in capite praecedenti[2] prodigiosa iamdiu ab explicationis studio nos et Platonicos alios absterruerunt. Sed quae diu cogitanti mihi certiora succurrunt imprimis adducam; denique probabilia subdam, inexplicabilia praetermittam. Nam et ipse Plato quaedam[3] noluit[4] explicari, sermonem vero hominibus inexplicabilem merito Musis attribuit, sed ludentibus, quia latet[5] aliquid fabulosum.

De circulis, conversionibus, revolutionibus, et qua opportunitate a superioribus inferiora ducantur. Cap. 1.

Principio ciclos, id est, circos vel circulos, nominat substantias ipsas mundanarum sphaerarum, praecipue vero caelestium. Appellat deinde peritropas, id est, conversiones, motus simpliciter circulares quos sphaerae caelestes et stellae quaelibet quasi fixae peragunt circa propria centra. Vocat praeterea periphoras,[1] id est, revolutiones vel ambitus, ipsos circuitus quos planetae omnes insuper agunt ab ortu ad occasum rursusque ad ortum vel vicissim; item a meridie ad septentrionem atque contra, rursus ante et retro, sursum atque deorsum, sive vicissim. Revolutiones ambitusve eiusmodi a conversionibus illis reguntur quidem, ac rebus terrenis accommodantur. Ipsae quoque revolutiones terrenis conversiones[2] accommodant atque coaptant. Vita igitur et fertilitas et opposita in rebus terrenis per caelestia mensurantur, sed ea lege ut aliae species plantarum[3] vel animalium aliis subiiciantur mensuris atque ducantur. Aliis enim pro ipsa naturae suae vel specialis vel singularis proprietate convenit una Saturni revolutio vel insuper dimidia vel[4]

* *Titulum in* Z (*p.* 1413.2); "Marsilii Ficini Florentini Platonici Expositio De Numero Fatali" *in* M (*fol.* 150r); *in* Y *deest.*

1. Marsilii Ficini *om.* Z 2. praescedenti Y sequente M 3. quidem M 4. voluit Z 5. satis M

1. peripteforas Z 2. conversionibus M 3. planetarum Z 4. vel *om.* Z

and a half, or two, three, or four revolutions) accords with some things, according to the property of their own nature (whether that of the species or that of the individual). However, one revolution of Jupiter accords with others or many revolutions accord (and similarly of Mars, the Sun, Venus, Mercury, and the Moon). For still others a fixed number of days is proper, or one day, or [merely] hours. There are those too that may be measured by one conversion of some star around the center or by many conversions, though they are unknown to us.[5] The time is also unknown to us which is absolutely meet for some effect, namely the time in which the spherical conversions necessary for this effect unite with the planetary revolutions necessary for the same effect, and finally combine with, and are adapted to, the preparation itself of things earthly. For then fate coincides with nature and executes the effect that is favorable or adverse to fertility or sterility, or that pertains to other matters.[6] Not only the dispositions of bodies in general but also in a way the varieties of feelings, of mental dispositions (*ingenia*),[7] and of habits and humors are led by this particular fatal and natural law. But certain divine (rather than human) dispositions prosper in certain ages, having been produced, that is, by the spherical conversions and the planetary revolutions that are determined by and known to God alone. These the perfect number measures—the number, I repeat, of centuries, or years, or months, or days, and known likewise to God alone. But more concerning this number elsewhere.[8] However, the condition of human dispositions is thought to be subject to different conversions and revolutions, and these are computed by numbers that are also different.

Chapter 2. How there are various durations of things.

Plato multiplies such a perfect number as it were to the numberless[1] in order to be able, with the whole of such a number, to measure the whole life of the world, or its reformation from deluge to deluge, or the great year. But with the parts of such a number he measures also the lesser durations pertaining to private or public form.[2] Take as an analogy the number seven which also measures many things: seven years the changes in life, seven days the greater changes in diseases, seven hours the lesser changes, now into the good, now into the bad.[3] However, when number reaches six,[4] which is perfect, it designates the perfect condition (*habitus*). When it reaches eight, which is defi-

duae vel tres vel quatuor; aliis autem una Iovis aut plures similiterque Martis aut Solis, Venerisque atque Mercurii aut Lunae; aliis certi[5] dies[6] vel dies una vel horae. Sunt et quae mensurentur conversione alicuius stellae circa centrum una vel pluribus sed nobis incognitis. Incognitum quoque nobis est tempus ad effectum aliquem penitus opportunum, quo scilicet conversiones ad hunc necessariae[7] concurrunt cum revolutionibus necessariis ad eundem, ac denique cum ipsa terrenorum praeparatione conveniunt atque coaptantur. Tunc enim fatum congruens cum natura effectum peragit vel prosperum vel adversum ad fertilitatem vel sterilitatem vel ad alia pertinentem. Non[8] solum vero dispositiones corporum omnino sed quodammodo etiam affectuum ingeniorumque et morum varietates fatali hac et naturali quadam lege ducuntur. Proveniunt vero quibusdam seculis divina quaedam ingenia potiusquam humana, producta videlicet a conversionibus revolutionibusque soli Deo certis atque destinatis. Quas sane numerus metitur perfectus, numerus inquam vel seculorum vel annorum vel mensium atque dierum similiter soli Deo [149v] notus. Sed de hoc numero alias aliquid. Humanorum vero ingeniorum conditio conversionibus revolutionibusque aliis per alios[9] quoque numeros computatis subiecta putatur.

Quomodo rerum durationes variae. Cap. II.

Multiplicat vero Plato numerum eiusmodi quasi ad innumerabile ut toto eiusmodi numero metiri possit totam mundi vitam[1] vel reformationem eius a diluviis ad diluvia vel annum magnum. Partibus vero numeri durationes[2] quoque minores ad privatam formam vel publicam pertinentes, sicut[3] etiam septenarius multa metitur: per annos quidem mutationes in [1415] vita, per dies autem mutationes in morbis maiores, per horas vero minores, tum in[4] bonum, tum in malum. Iam vero quando numerus pervenit ad sex qui perfectus est designat perfectum habitum; quando ad octo qui deficit partibus forte deficien-

5. certe Z 6. dicitur Z 7. necessarie YM necessario Z 8. Ac Z
9. alias Z

1. machinam M 2. durationis Z 3. sicuti M 4. videlicet M

cient in parts, it designates perhaps the deficient condition—unless the thing can be balanced by the solidity of the number or for another reason.[5] When it reaches twelve, which is abundant [in parts], it designates fertility.[6] When it arrives at unequilateral numbers, it designates inequality;[7] when at equilateral numbers, equality;[8] when at solid numbers, constancy and plenitude.[9] But more will be said about these matters in the ninth book.[10] Likewise, with diagonal powers (*diametrales*), when it arrives at the proportion of being less than double, it signifies sterility. However, with the same powers, when it arrives at the proportion of being greater than double, it signifies fertility. But this will be discussed a little later.[11]

Chapter 3. On the prime solid numbers and on the number twelve. How twelve contains consonances within itself and when thrice multiplied unfolds them to the full.

Let us return to the numeral order first posited by Plato.[1] Plato affirms that he is speaking of the numeral order in which, for the first time, there are four terms and three intervals. It is clear from the *Timaeus*[2] that this order is between the prime solids, that is, between 8 and 27, whose proportional means are two, namely 12 and 18. Thus far the terms are four, and the intervals among them are necessarily three: the first being from 8 to 12, the second from 12 to 18, the third from 18 to 27. But the proportion is everywhere alike among these terms. For the proportion of 27 to 18 is in the ratio of three to two. For it contains the whole [i.e., 18] and a half besides [i.e., 9]. The proportion is similar from 18 to 12, and from 12 to 8. But between the prime solids, that is, 8 and 27, are the two equilateral planes, that is, 9 and 16, which envelop an unequilateral plane between themselves, namely 12. For just as from 16 to 12 the proportion is in the ratio of four to three—for 16 contains the whole [i.e., 12] and a third part besides [i.e., 4]—so from 12 to 9 the proportion is discovered to be in the ratio of four to three.[3] Therefore, since in the numeral order taken up initially the [prime] solids are connected by way of the two means [i.e., 12 and 18][4]—both with the proportions to the solids in the ratio of three to two—but since the planes [i.e., 9 and 16] are joined by only the one mean [i.e., 12] with the proportions in the ratio of four to three, it is appropriate that Plato, having seized the occasion here, should bring to our attention the prime foundations of such propor-

tem, nisi res soliditate numeri vel ratione alia compensetur; quando ad[5] duodecim qui abundat, fertilitatem; quando ad numeros inaequilateros, inaequalitatem; quando ad aequilateros, aequalitatem; quando ad solidos, firmitatem atque plenitudinem. Sed de his in nono[6] dicetur. Proinde quando in diametralibus pervenit ad proportionem dupla minorem, sterilitatem; quando vero in eisdem ad proportionem dupla maiorem, fertilitatem. Sed de his paulo post agetur.

De primis solidis numeris et de duodenario, quomodo et intra se continet consonantias et ter multiplicatus explicat eas in amplum. Cap. III.

Redeamus ad numeralem ordinem primo positum a Platone. Affirmat Plato se loqui de ordine numerali in quo primo sint termini quatuor et intervalla tria. Manifestum vero est ex *Timaeo* hunc ordinem esse inter solida prima, scilicet inter 8 atque 27 quorum sunt media proportionalia duo, scilicet 12 et 18. Hactenus sunt termini quatuor inter quos necessario intervalla sunt tria: primum ab 8 ad 12, secundum a 12 ad 18, tertium a 18[1] ad 27.[2] Inter hos vero terminos similis est utrinque proportio. Nam ab ipso[3] 27 ad 18 sexquialtera proportio est. Continet enim totum insuperque dimidium. Similis ab hoc ad 12[4], similis a 12 ad 8 proportio. Inter prima vero solida, scilicet 8 atque 27, sunt plana aequilatera duo, scilicet 9 atque 16. Haec planum quoddam inaequilaterum, scilicet 12, inter se convinciunt. Nam sicut ab ipso 16 ad 12 sexquitertia proportio[5] est—continet enim totum tertiamque insuper eius partem—sic ab ipso 12 ad 9 sexquitertia proportio reperitur. Cum igitur in ordine numerali imprimis adsumpto solida quidem per media duo plana[6] sexquialteris proportionibus colligentur, plana vero uno dumtaxat medio proportionibusque sexquitertiis vinciantur, merito Plato hinc[7] nactus occasionem prima fundamenta proportionum eius-

5. ad *om.* Z 6. Novo Y bono Z

1. tertium a 18 *om.* Z 2. 17 Z 3. ipsis M 4. 22 Z 5. reportio Z
6. plana] *delendum* 7. hunc M

tions, namely the 7 and the 5. For the first instance of proportion bearing the ratio of three to two is between 3 and 2; whence the number five is called the prime root of such a proportion. The first instance too of that proportion bearing the ratio of four to three is between 4 and 3. Therefore the number seven is called the root or foundation of that bearing the ratio of four to three. But Plato especially esteems these two proportions, because the proportion bearing the ratio of three to two generates the consonance *diapente*,[5] and that bearing the ratio of four to three produces the consonance *diatessaron*.[6] He esteems these most because from them is produced the universal consonance that consists in that double proportion which they call the harmony *diapason*, the most celebrated of harmonies.[7] Hence therefore Plato cultivates the number twelve preeminently as the first of the means among the [prime] solids. For it is constituted from the two roots of these proportions and consonances, namely from the numbers five and seven by way of composition[8] (as we said); and likewise by a way of mutual commixture, namely among the parts.[9] Resolve the number five into 3 and 2. Twice 3 is 6, and likewise twice 3 twice is 12 or twice 6 is 12. Resolve 7 into 4 and 3. Thrice 4 is 12. Thus not only do 7 and 5 added make 12, but when the parts in both are mixed together, that is, are multiplied, they also make 12. Twelve is also made from the first numbers multiplied together, that is, thrice 4 is 12. For if two is not a determined number but a confused multitude, then the first numbers are 3 and 4,[10] the elements of the number 12, and should be celebrated on this account. But Plato venerates the number 12 not only secretly here but also openly in the *Laws*, the *Phaedo*, the *Timaeus*, the *Phaedrus*, and the *Critias*. In the *Phaedo* with twelve [as] the number of the forms he describes the globe.[11] In the *Critias*, in referring to the twelve regions, he is describing the ancient reigns before the flood.[12] In the *Laws* he uses the same number to arrange the city and fields.[13] In the *Phaedrus* he adduces the twelve orders of the gods.[14] In the *Timaeus* he forms the world with twelve faces both because of the twelve spheres of the world and the twelve signs and divinities in the zodiac;[15] and likewise because of the twelve parts [or zones] of the [four] elemental spheres, since each is divided into three, namely into a superior, an inferior, and a middle zone. But this is sufficient. We have already talked about it in the commentaries on the *Timaeus*, in the arguments for the *Laws*, and in the *Theology*.[16] Wherefore Plato judges this number twelve to be the governor of the universal world

modi adducit in medium, septem videlicet atque quinque. Prima enim sexquialtera inter tria nascitur atque duo. Unde quinarius prima dicitur proportionis[8] eiusmodi radix. Prima quoque sexquitertia inter quatuor provenit atque tria. Quocirca septenarius radix vel fundum[9] dicitur sexquitertiae. Plato vero proportiones eiusmodi magni facit,[10] quoniam et sexquialtera consonantiam generat diapente[11] et sexquitertia consonantiam procreat diatesseron. Quas ideo plurimi facit, quoniam ex his conflatur universalis consonantia illa in[12] dupla proportione consistens quam diapason harmoniam vocant summopere celebratam. Hinc igitur Plato colit magnopere duodenarium ceu primum inter solida medium, quoniam ex duabus radicibus illis proportionum consonantiarumque eiusmodi constituitur, quinario videlicet atque septenario per modum compositionis (ut diximus), item quodam mutuae commixtionis modo videlicet inter partes. Resolve quinarium in 3 scilicet atque 2. Bis 3 = sex. Item bis 3 bis = 12, vel bis sex = 12. Resolve 7 in 4 atque 3. Ter 4 = 12. Non solum ergo 7 et 5 composita faciunt 12, sed in utroque partes invicem mixtae, scilicet multiplicatae, 12 quoque conficiunt. Fit etiam 12 ex primis numeris in se invicem multiplicatis, scilicet ter quatuor = 12. Si enim duo non sit determinatus numerus sed multitudo confusa, primi numeri sunt 3 atque 4 elementa duodenarii ob hoc etiam celebrandi. Non solum vero clam hic, sed etiam palam in *Legibus, Phaedone, Timaeo, Phaedro, Critia* duodenarium veneratur. In *Phaedone* quidem duodenario formarum numero describit orbem. In *Critia* vero plagis duodecim antiqua ante diluvium regna describit. In *Legibus* eodem numero civitatem agrosque disponit. In *Phaedro* duodecim adducit ordines divinorum. In *Timaeo* duodecim faciebus format mundum, etiam propter sphaeras mundi 12, signaque[13] et numina in zodiaco 12, item partes elementorum duodecim siquidem quodlibet in tria dividitur, in plagam videlicet superiorem, inferioremque et me[150r]diam. Sed de his quidem satis. In commentariis in *Timaeum* et argumentis *Legum* et *Theologia* iam a nobis est dictum. Quapropter Plato numerum hunc universalis formae mundanae vel humanae atque civilis[14] gubernatorem esse iudicat,

8. proportionis *om.* M 9. fundamentum Z 10. magni facit] magnificat M
11. diaxente Z 12. in *om.* Z 13. signatque Z 14. civilibus Z

form, of the human form, and of the form of the state.[17] He judges it to accord most with the propagation or mutation of things, since, as we shall show later, it is the first of the increasing and abundant numbers.[18] Twelve is made from the number six twinned, from six the perfect number as we call it. In other words, twelve is more than perfect. Nor does it want mystery in that in its composition Plato elects 7 and 5. For 7 corresponds with the 7 planets, and the number 5 with the regions of the world, that is, with the 4 elementary regions and with heaven. Likewise 5 is the prime origin of the perfect circular number. For if you lead it through the plane to itself [i.e., square it] it makes 25, and if you lead it back through the solid to itself [i.e., cube it] it makes 125. And each is a circular number in that each commences from the number 5 and ends in the number 5.[19] Hence the number 12 accords most with the world orb. But compared with the rest [of the planets] it accords [most] with the Sun, Venus, Jupiter, and the Moon, the fountains of life.[20] The Sun and Venus each complete their orbits in 12 months, Jupiter in 12 years.[21] Daily the Moon passes through 12 degrees "in middle motion," and she has her [28] mansions of 12 degrees;[22] and she enacts 12 months with the Sun. Not without weighty cause has this number been observed by the Prophets and in sacred writings.[23] Now I leave aside the fact that 12 twinned completes the day and much similar.

[ii] However, since Plato had chiefly posited four terms in that prime numeral order—8, 12, 18, 27—and since he wished to arrive thence at the fatal and great number, he could not choose a number less than the 12. For the ten is not contained in a lesser number—the ten that is in a way the universal number and the origin of the universal numbers insofar as from it teem 100, 1,000, 10,000, 1,000,000.[24] Under the preeminently fatal number it must needs be too that the somewhat lesser fatal number, 729, should be comprehended—729 which is celebrated in the ninth book of the *Republic*[25] and produced from 9 thrice increased. But 9 is contained under 12—not only under a greater number as it were, but also in a certain proportion, namely in the ratio of three to four. But the number twelve embraces ten not only in amplitude but also in proportion. For 12 has to 10 the proportion in the ratio of six to five. When [in terms of this ratio] the twelve seems to divide the ten into 5 parts, and to add to the ten the two, that is, the fifth portion of the ten, then it completely remakes the ten. For if you lead [i.e., multiply] the two to the five, you will immediately make the ten. Therefore 12, when it embraces and remakes

plurimumque rerum propagationi vel mutationi congruere, quoniam, ut in sequentibus ostendemus, primus est crescentium abundantiumque numerorum. Fit ex geminato senario numero ut dicemus perfecto, videlicet ipse plusquam perfectus; neque mysterio caret quod in eius compositione 7 elegit atque 5; nam septem planetis 7 competit, quinarius quinque mundi plagis, scilicet quatuor elementis et caelo. Item quinque origo prima est perfecti numeri circularis. Sive enim per planum in se ducas, efficit 25; sive per solidum in se reducas, facit 125; uterque vero circularis existit, incipiens videlicet a quinario desinens in quinarium. Hinc duodenarius orbi maxime congruit, prae ceteris vero cum Sole, Venere, Iove,[15] Luna, vitae fontibus. Sol Venusque duodecim percurrit mensibus,[16] Iupiter annis duodecim. Luna quotidie gradus peragit duodecim motu medio, suasque duodecim graduum mansiones habet, ipsaque cum Sole menses agit duodecim. Nec[17] sine gravi causa hic numerus est a prophetis sacrisque eloquiis observatus. Mitto nunc quod duodecim geminatus implet diem multaque similia.

[ii] Cum vero Plato in primo illo ordine numerali quatuor praecipue terminos posuisset, 8, 12, 18, 27, velletque illinc ad fatalem magnumque numerum pervenire,[18] non poterat minorem eligere quam 12. Nam in minori non continetur decem, qui quodammodo universus est numerus, numerorumque universalium est origo quatenus ex eo pullulant centum, mille, decem milia, mille milia. Oportebat quoque sub hoc imprimis fatali numero compraehendi fatalem illum aliquanto minorem, scilicet 729 in[19] nono de *Re Publica* celebratum a nove[1416]nario ter aucto procreatum. Continetur autem 9 sub 12 non solum quasi[20] sub maiore verum etiam proportione quadam, scilicet sexquitertia. Numerus vero 12 ipsum decem non solum amplitudine sed etiam proportione complectitur. Nam proportionem sexquiquintam habet ad decem; atque dum dividere videtur ipsum in partes quinque, binariumque quintam denarii portionem[21] denario superaddere, tunc maxime[22] reficit ipsum decem. Si enim binarium duxeris in quinarium, decem profecto conficies. Itaque 12, dum numerum universum proportione complectitur atque reficit, ad universum maxime pertinere videtur.

15. sunt Z 16. mentibus Z 17. Neque M Haec Z 18. provenire Z
19. in *om.* M 20. 9 M 21. proportionem Z 22. maximum M

the universal number [10] in this proportion [of 6:5], seems to pertain completely to the universe.[26]

[iii] Moreover twelve, just as it contains those two harmonies, the elements of the diapason,[27] within itself, so when it is increased twice—namely 12x12—it bears these same harmonies within itself and fully unfolds them under the plane and equilateral number, namely 144.[28] Again, when it is increased thrice—namely 12x12x12—with itself it also extends these same two harmonies even further under the solid and equilateral number that is created by such a multiplication, namely 1728. And this number indeed most accords with the universe. For 1000 accords with the firmament, but 700 with the 7 planets. To these is added 28 to represent the lunar circuit; for this circle expedites and perfects fate. Indeed the return of the Moon to the same point of the zodiac is designated by the number 28. But the return of the Moon to the Sun is expressed precisely by 29;[29] and this is declared in the *Republic* book 9.[30] The number 28 accords with the Moon for another reason too, namely because she has 28 famous mansions.[31] Six is the prime perfect number; but the second perfect number is 28 because it is made from its own parts as 6 is. For 6 accords with the 6 higher planets, but 28 accords with the Moon. After the first perfection that comes [to us] from the six higher planets, she brings to things subject to fate the second perfection.[32]

[iv] Plato chiefly accepts the numbers, however, that can accord with the universe and embrace [its] consonances in order to show, by way of certain numbers and measures, that the good fortunes of lower things depend on the universe and especially when they are in accord with these numbers and measures. But he extends the fatal numbers to the solid as to the highest point,[33] so that hence he might show, when this highest point has already been attained, that little by little all are brought back to the opposite [the lowest point]. For the condition of mobile nature does not suffer it to remain for a long time in the same or in a similar disposition (*habitus*).

Chapter 4. On increasing and decreasing numbers, and those that are like and unlike.

In the first numeral order, which proceeds from the solid 8 to the solid 27, and similarly in the numbers produced from it, the number of overcoming augmentations is equal to those overcome, as Plato says.[1] For everywhere the half corresponds to the double, the third to

[iii] Praeterea duodenarius, sicut intra se duas illas continet harmonias ipsius diapason elementa, ita quando bis augetur, scilicet duodecies duodecim, secum profert easdem explicatque in amplum sub numero plano aequilateroque, scilicet 144.[23] Rursus quando ter augetur, scilicet duodecies duodecim duodecies, easdem harmonias secum latius quoque diffundit sub numero solido atque aequilatero[24] qui eiusmodi multiplicatione creatur, scilicet 1728, qui sane numerus maxime convenit universo. Nam mille quidem congruit firmamento, septies vero centum planetis 7, additum vero est 28 ad lunarem circuitum exprimendum. Hic enim circuitus fatum[25] expedit atque perficit. Reditus quidem Lunae ad idem zodiaci punctum 28 numero designatur, reditus autem eiusdem ad Solem 29 prorsus exprimitur; quod in nono de *Re Publica* declaratur. Convenit numerus 28 Lunae alia etiam ratione, quoniam Luna 28 mansiones habet insignis.[26] Senarius quidem primus numerus[27] est perfectus; secundus vero perfectus est 28 quia suis partibus constat ut ille. Ille igitur convenit cum superioribus sex planetis; hic vero cum Luna, quae post primam illinc perfectionem ipsa secundam fatalibus adhibet.

[iv] Accipit vero Plato numeros potissimum qui cum universo conveniant consonantiasque complectantur, ut ostendat inferiorum eventus per certos numeros atque mensuras ab universo pendere praecipue quando consonant ista cum illis. Producit autem numeros fatales ad solidum velut ad summum ut hinc ostendat, ubi ad summum iam perventum est, paulatim in oppositum omnia relabi, quippe cum in eodem vel simili habitu diutius permanere mobilis naturae conditio minime patiatur.

De numeris crescentibus et decrescentibus, similibus[1] atque dissimilibus. Cap. IIII.

In primo autem illo ordine numerali ab 8 solido usque ad 27 solidum procedente[2] similiterque in numeris inde productis, quot sunt augmentationes superantes totidem superatae, ut Plato inquit; ubique enim duplae respondet subdupla,[3] triplae quoque subtripla. Item quot

23. 144 *scripsi* 164 Y 169 Z *om.* M 24. scilicet 144. . . . aequilatero *om.* M
25. factum Z 26. insignes Z 27. primus numerus *tr.* M

1. similibusque M 2. procedentes YZ 3. subtripla YZ

the triple.[2] Likewise among the manifold proportions, the overcoming ones as it were are immediately matched by those that are being divided—those that have been in a way overcome yet remain entirely congruent. Thus the sesquialteral proportion [of 3:2] accords with the double proportion [of 2:1]. For just as the greater here doubles the lesser—for instance, 4 doubles 2—so the sesquialteral proportion, when it divides, distributes the lesser number as it were into two and gives us the ratio of 6 to 4.[3] For over and beyond the fact that the sesquialteral proportion contains the whole once, it seems to divide in a way and to add the half to the whole. Similarly, the sesquitertial proportion [of 4:3] seems to accord with the triple proportion [of 3:1], and the sesquiquartal proportion [of 5:4] with the quadruple [of 4:1]. And successively multiples endlessly augment as it were the number [to be divided], but those that do the dividing diminish as it were the result.[4]

[ii] Furthermore, the increasing and decreasing numbers are named here by Plato. For a certain number is said to be perfect because it is constituted exactly from its parts, namely from its several parts placed in their successive order; for instance the six is constituted from one, from two, and from three.[5] These indeed are truly parts of the six; for any one of these parts taken up several times makes the six, and likewise arranged (as I said) successively—1, 2, 3—the parts constitute 6 exactly. Hence the number 6 customarily is called perfect. It is also perfect for another reason: it is made exactly from a double proportion which it contains perfectly within itself, namely the proportion of the four to the two; but four and two together equal six. You may find this in other numbers only with great difficulty. But the perfection of the six as a half is referred to the 12 as the whole.

[iii] However, a number is customarily called deficient because its several parts thus simply arranged do not make up the whole. Take 8. Its parts indeed are 4, 2, and 1.[6] But these arranged make 7. The like goes for 9 with regard to its parts.

[iv] A number is judged abundant, however, because its parts when so arranged swell to something bigger than itself. Take 12. Its parts are: the half—6, the third—4, the fourth—3, the sixth—2, the twelfth—1. But these parts added together eventually make 16.[7] But they increase happily. For they rightly proceed from the unequilateral [12] to the equilateral [16] with the proportion preserved, for the proportion of 16 to 12 is in the ratio of 4:3, as is that of 12 to 9, nine being also an equilateral.[8] Therefore twelve accords most with the

sunt proportiones ipsae multiplices quasi superantes totidem subinde sunt partientes quodammodo superatae sed penitus congruentes. Nam duplae respondet sexquialtera. Sicut enim dupla minorem numerum geminat, ut quatuor geminat duo,[4] ita sexquialtera dividendo minorem quasi partitur in duo, ut sex ad quatuor. Praeter enim id quod totum semel continet, videtur quodammodo distribuere dimidiumque addere super totum. Similiter sexqui[150v]tertia quidem triplae, sexquiquarta vero quadruplae respondere videtur atque deinceps sine fine multiplices quidem augent[5] quasi numerum, partientes vero minuunt quasi continuum.

[ii] Praeterea nominantur hic a Platone numeri crescentes[6] atque decrescentes. Aliquis enim numerus dicitur perfectus quoniam ex suis partibus, scilicet aliquotis deinceps ordine positis, constat ad unguem, ut senarius ex uno, duobus, tribus. Hae sane revera sunt senarii partes; quaelibet enim earum aliquotiens sumpta senarium complet. Itemque dispositae (ut dixi) deinceps 1, 2, 3, ad unguem 6 efficiunt.[7] Hinc senarius numerus perfectus appellari solet. Est etiam alia ratione perfectus, quia constat ad unguem proportione dupla quam intra se proxime continet, haec autem est quaternarii ad binarium, sed[8] quatuor simulque duo = sex. Id in aliis numeris vix invenias. Perfectio vero senarii velut dimidii refertur ad 12 tanquam totum.

[iii] Aliquis vero numerus nominari deficiens consuevit, quia partes aliquotae simpliciter ita dispositae non implent totum, ut 8. Nempe partes eius sunt 4, 2,[9] 1; hae[10] vero digestae septem faciunt. Similiterque 9 se habet ad partes.

[iv] Aliquis vero numerus iudicatur abundans, quia partes eius ita compositae in maiorem excrescunt, ut 12. Partes huius sunt dimidia quidem 6, tertia vero 4, sed quarta 3, sexta[11] 2, duodecima 1. Partes autem hae congestae 16 postremo conficiunt. Crescunt vero feliciter. Nam ab inaequilatero ad aequilaterum recte procedunt proportione servata, quoniam 16 ad duodecim sexquitertiam proportionem habet sicut 12 ad 9 etiam aequilaterum[12] habuit sexquitertiam. Itaque maxime convenit universo et fertilitatem incrementumque significat, praesertim quia primus est et[13] princeps abundantium numerorum.

4. ita duo *add.* Z 5. auget M 6. decrescentes M 7. efficunt Y 8. scilicet Z 9. 8 Z 10. Haec Z 11. septa Z 12. aequilateram Z 13. est et] esset M

universe and signifies fertility and increase, especially because it is the first and the prince of the abundant numbers. Furthermore, the Pythagoreans called 6 the spousal number,[9] because in its conception a male joins with a female, that is, an odd [number] with an even—2x3. But 6 is the first of the spousal numbers and 12 is the second (in the twelve's conception 3 mingles itself with 4—3x4=12). But where even and odd are distanced by intermediary numbers, they do not seem to unite as spouses.[10]

[v] Furthermore, Plato introduces here certain similar and dissimilar numbers.[11] Said to be similar among themselves, and preeminently so, are equilaterals with regard to equilaterals, cubes with regard to cubes. But those unequilaterals are [also] similar whose sides are proportional. Take 6 and 24.[12] The width of 6 is 2, the length 3. Twice 3 is 6. But the width of the number 24 is 4, the length 6; for 4 times 6 is 24. But the same ratio exists between 6 and 3 as between 4 and 2. Therefore, the same ratio exists between the width of 24 and the width of 6 as between the length of 24 and the length of 6. For this reason they are called similar. But those that do not accord with such proportions are adjudged dissimilar.

Chapter 5. On numbers associated with sides and with diagonals.

Unity itself, as it is the principle of numbers and of figures,[1] so it is the principle of the side and of the diagonal, and has the power for each. Take therefore this unity A here, but that unity B there. Indeed A, while it stays alone, makes no line at all and therefore makes neither the side nor the diagonal. If A proceeds to its twin, then it will make the line, which can become the side of the future square. Again, if it has proceeded so far as to make the diagonal—and because the diagonal is necessarily greater than the side—then it has proceeded at least to the three. Wherefore, just as you have brought the unity A forth to the two, so you will have brought the unity B forth to the three, so that A signifies the side of the future square, but B the diagonal.[2] The square that is generated from the binary A led to itself is undoubtedly four. But the square that comes from the ternary B similarly led to itself becomes nine. Therefore the square made from the diagonal [compared] with the square generated from the side is greater by one than double.[3]

Praeterea Pythagorici 6 sponsalem numerum vocaverunt, quoniam in eius conceptu mas cum femina coit, scilicet impar cum pari—bis 3. Sex est autem sponsalium primus, secundus vero[14] 12 (in cuius conceptu 3 cum 4 se commiscet—ter 4 = 12). Ubi vero par et impar per media distant, congredi non videntur.

[v] Introducit hic insuper Plato numeros quosdam similes atque dissimiles. Similes quidem inter se dicuntur aequilateri plurimum aequilateris, cubi cubis. Inaequilateri vero invicem illi sunt consimiles quorum latera proportionalia sunt,[15] ut 6 atque 24. Latitudo senarii est 2, longitudo 3; nempe bis 3 = 6. Numeri vero 24 latitudo 4, longitudo 6; quater enim 6 = 24. Quemadmodum vero se habet 4[16] ad 2, ita 6 ad 3. Itaque sicut se habet latitudo numeri 24 ad senarii latitudinem, ita longitudo illius ad senarii longitudinem. Qua quidem ratione similes appellantur. Qui vero proportionibus eiusmodi non conveniunt dissimiles iudicantur.

[1417] De numeris lateralibus atque diametralibus. Cap. V.

Unitas ipsa, sicut numerorum figurarumque[1] principium est, ita lateris et diametri, atque ad utrumque potentiam habet. Expone igitur hic quidem hanc unitatem A, ibi vero unitatem illam B.[2] A quidem, dum sola manet, nullam efficit lineam, igitur neque latus neque diametrum. Si ad geminum A processerit, lineam iam efficiet, quae possit latus fieri futuri quadrati. Si rursus adeo processura sit ut faciat[3] diametrum—quoniam diameter necessario est latere maior—saltem processura est in tria. Quapropter, sicut unitatem A ad binarium produxisti, sic unitatem B[4] producturus es ad ternarium, ut A quidem significet quadrati futuri latus, B[5] vero diametrum. Quadratum quidem quod ex A binario procreatur in se ducto est proculdubio quaternarius, quadratum vero quod ex B ternario similiter in se ducto fit novenarius. Itaque quadratum hoc ex diametro factum ad quadratum illud ex latere procreatum unitate maius est quam duplum.

14. mas cum ... secundus vero *om.* Z 15. sunt *om.* M 16. 4 *om.* Z

1. figuramque Z 2,4,5. B] 6 Z 3. faciet M

[ii] If you wish to bring forth greater squares again from the sides, and similarly from the diagonals, add to the side of two that diagonal of three. Now you will have five for the side. Also add to that diagonal of three twice that side of two. You will now have seven for the diagonal. Therefore make the square from the side of 5 led to itself. The square will be 25. Do likewise with the diagonal 7 and the square will be 49. This diagonal square will be less by the one than double that lateral square [of 25]. For this is the ratio of 49 to 25.[4]

[iii] Again, in order for you to make bigger squares, add to the side that was 5 the diagonal that was 7. You will have 12 for the side. In turn add to the diagonal that was 7 twice that side of 5. The diagonal will be 17. From that side of 12 led to itself you will obtain the square 144. From the diagonal of 17 led to itself, however, you will have the square 289, which is greater by the one than double the square [of 144] made from the side.[5]

[iv] However, in increasing the squares, why must we add the earlier diagonal by itself to the earlier side, and yet add both the earlier sides to the diagonal? Because twice the power of the side can equal only once the power of the diagonal.

[v] But compensation must in general be made.[6] If you proceed in increasing the squares to 100 and beyond, at length adequation will be accomplished, now in the outcome being less by one, now in turn being more. All told, therefore, the result will be the double proportion [of 2:1].[7] Accordingly, Plato says that such numbers need the 1 as the equalizer, the incommensurables singly but the commensurables together.[8] But more of commensuration in what follows.[9] But perhaps Plato is talking about two incomparable [relationships], because in the first constitution of the squares—where the diagonal was 3 to the side of 2—he had proportion,[10] but in the second constitution where it was 7 to 5, he did not. Similarly in the third constitution, where it was 17 to 12, he was lacking proportion. But he calls the diagonal numbers "of the five,"[11] because in the first instance the side was 2 and the diagonal 3. He names solids "of the three,"[12] because triple replication makes solid numbers, and triple dimension makes the solid body. But preeminently he calls those solids "of the three" which he produces from the nine (which is resolved into the three).[13]

[ii] Si cupis quadrata rursus maiora producere ex lateribus similiter atque diametris, adde lateri quidem illi binario diametrum illum ternarium. Habebis quinarium iam pro latere. Adde etiam illi diametro scilicet ternario bis latus illud binarium, habebis iam septenarium pro diametro. Fac ergo quadratum ex quinario latere in se ducto; erit quadratum viginti quinque. Fac similiter ex 7 diametro; erit quadratum 49. Quadratum hoc diametrale erit ad illud laterale[6] unitate minus quam duplum. Ita enim 49 ad 25 se habet.

[iii] Iterum ut ampliora quadrata conficias, adde lateri quod erat 5[7] diametrum quod fuit 7, habebis pro latere 12; vicissimque diametro quod erat 7 bis latus illud scilicet 5, erit diameter 17. Ex illo quidem latere scilicet 12 in se ducto reportabis[8] quadratum 144. Ex diametro autem hoc 17 in se ducto habebis quadratum 289, quod est unitate maius quam duplum ad quadratum ex latere factum.

[iv] Sed curnam oportet in augendis quadratis[9] priori quidem lateri addere diametrum prius[10] unum, diametro vero latera priora duo? Quia videlicet quantum latus bis valet tantum diameter potest semel.

[v] Omnino[11] vero compensatio facienda. Si in augendis quadratis ad centum[12] et ultra processeris, tandem adaequatio fiet, tum unitate deficiente, tum excedente vicissim, ut summatim resultet pro[151r]portio dupla. Ideo Plato inquit eiusmodi numeros indigere uno scilicet aequatore, et incommensurabiles quidem singulatim, commensurabiles vero summatim. Sed de commensuratione in sequentibus. Inquit vero duos incomparabiles forte, quoniam in prima quidem horum constitutione 3 ad duo proportionem habuit, in secunda vero 7 ad 5 non habuit, similiter in tertia 17[13] ad 12 proportione carebat. Appellat autem diametrales numeros quinitatis,[14] quia in primo latus quidem fuit 2, diameter vero 3. Solidos nominat trinitatis, quia trina replicatio numeros facit solidos et trina dimensio corpus solidum. Sed praecipue illos solidos vocat[15] trinitatis quos producit ex novenario qui resolvitur in ternarium.

6. latere M   7. 5] v. quinque Z   8. reportatis Z   9. quadritis Y
10. prium Y primum Z   11. Omnis Z   12. centrum M   13. 97 YZ
14. quinitates YZ (*vide Rempublicam* 546C4–5; *nota lectiones "pempados," "pempadôn"*)   15. vocant Z

Chapter 6. Plane and solid numbers, also equilateral and unequilateral, even and odd, feminine and masculine numbers.

Plato calls plane numbers those numbers which are generated by prime [i.e., simple] multiplication, as 2x2=4 or 3x3=9, and so on similarly. He calls solids, however, those which are born not only from prime multiplication but from triple replication, as 2x2x2=8, 3x3x3=27, and so on similarly.[1] In both categories are equilaterals and unequilaterals. Equilaterals indeed are created from any number multiplied by itself; of this kind are those we have just spoken about. But unequilaterals arise from the multiplication of one number by another, as in the planes 2x3=6, 3x4=12, and so on similarly, and as in the solids 2x3x2=12, or 2x3x3=18.[2] Therefore unequilaterals are called either "those which are longer by one part" or "oblongs."[3] Those which are longer by one part for the sake of brevity I shall more often refer to as "longs." They are generated from the leading of any one number to the next, as 2x3=6, 3x4=12; and in them the greater number to which the lesser is led is greater than the lesser only by one. But "oblongs" are generated from the leading of a number to a more distant number, as 2x4=8, 3x5=15; for here the greater number exceeds the lesser by a distance greater than one.[4]

[ii] Thus far these numbers—plane or solid, equilateral or unequilateral, long or oblong—are made by multiplication either of some number by itself or of some number by another—in both cases by reason of commixture and of generation.[5] Furthermore, they can also be made by way of composition [i.e., addition]. To constitute them, a number is added either to the one or to a number successively. Equilaterals are constituted when odd numbers are added to odd, starting with the one; unequilaterals, when even are set to even, starting with the two. But let us begin with equilaterals.[6]

[iii] The odd numbers in sequence are 1, 3, 5, 7, 9, 11. One, as the first equilateral, is a square; for once one is one. If you add 3 to this as to an odd number, you will make the squared equilateral 4. This will be two-footed equally in breadth and in length. The next odd number is 5. If you add this like a workman's square to the preceding square [of 4], you will get 9. This square is similarly an equilateral, whose sides will each be three-footed. The next odd number is 7. Now if you move it to 9, you will make 16, four-footed equally in length and breadth, for 4x4=16, and so on similarly.[7] In these, plainly the odd

Numeri plani et solidi, item aequilateri et inaequilateri, pares, impares, feminae, masculi. Cap. VI.

Numeros appellat planos qui prima multiplicatione numeri procreantur, ut bis 2 = 4, vel ter 3 = 9, similiterque deinceps; solidos autem qui non solum multiplicatione sed etiam terna replicatione nascuntur, ceu bis 2 bis = 8, ter tria ter = 27, deincepsque similiter. Utrobique vero vel aequilateri vel inaequilateri sunt. Aequilateri quidem ex numero quolibet per se in se ipsum multiplicato creantur, quales sunt quos modo narravimus. Inaequilateri vero ex multiplicatione numeri alterius per alterum oriuntur, velut in[1] planis quidem bis 3 = 6, ter 4 = 12, similiterque deinceps; in solidis autem bis 3 bis = 12, vel bis 3 ter = 18. Proinde inaequilateri vel altera parte longiores vel oblongi dicuntur—altera quidem parte longiores quos brevitatis causa saepius appellabo longos. Illi sunt qui ex[2] ductu numeri alicuius[3] in proximum procreantur, ut bis 3 = 6, ter 4 = 12, in quibus maior numerus in quem minor ducitur hoc ipso minore unitate dumtaxat est maior. Oblongi vero ex ductu numeri in remotiorem numerum generantur, ut bis 4 = 8, ter 5 = 15; hic enim maior numerus minorem longiore spatio quam unitate superat.

[ii] Hactenus hi numeri—plani vel solidi, aequilateri vel inaequilateri, longi vel oblongi—multiplicatione fiunt vel numeri alicuius per se ipsum vel numeri alterius per alterum, utrobique quadam commixtionis generationisque ratione. Confici praeterea possunt quodam compositionis modo, quando videlicet ad eorum constitutionem unitati deinceps vel numero numerus additur: aequilateri quidem quando impares imparibus unitate duce numeri adhibentur, inaequilateri vero quando pares paribus duce duitate subduntur. Sed ab aequilateris ordiamur.

[iii] Sunt autem consequentes[4] impares: 1, 3, 5, 7, 9, 11. Unum quidem quasi primum aequilaterum quadratum est; semel enim unum existit unum. Huic tanquam impari si addideris 3, quadratum facies aequilaterum, scilicet quaternarium, quod et latitudine et longitudine pariter erit bipes. Consequens impar 5. Hunc si praecedenti quadrato addideris ceu normam, reportabis 9, quadratum similiter aequilaterum cuius latus quodlibet erit tripes.[5] Consequens impar 7. Nunc[6] si ad-

1. in *om.* Z 2. sex Z 3. numeri alicuius *tr.* M 4. consequenter Z
5. tripes *scripsi* triples YM triplex Z 6. Hunc M

number is always put to the preceding number, which is either an odd number, or at least constituted from two odd numbers, starting always with the one.[8] For just as the one is the leader of the odd and equilateral numbers, so the two is the leader of the even numbers, of those numbers composing as it were the unequilateral figure.[9]

[iv] For the two is as it were the first unequilateral, since it is the first to descend from the one, the most equal of all. Therefore twice 1 is 2. This two is 1 in breadth but 2 in length. But truly the Pythagoreans wanted duality to be something indeterminate, to be the principle of no one figure.[10] For they suppose that 1 is the principle of the circular figure, because it is converted to itself—for 1x1 or even 1x1x1 only exists as 1. But they suppose that the trinity is the principle of the rectilinear figures. For the three is the first trigon; and the triangle is the first of the rectilinear figures, triangles indeed composing squares and all the rest.[11]

[v] But of this elsewhere. Let us return to our purpose. Therefore the various even numbers are expounded in order: 2, 4, 6, 8, 10, 12, and the rest similarly. Compound [i.e., add] 2 with 4 and you will make 6. Likewise compound this 6 with 6 and you will obtain 12. Add 8 to 12 and you will make 20. Therefore in sequence the long numbers will be 6, 12, 20; and with those that follow, the same reasoning will pertain.[12] The equilateral numbers were successively even and odd—4, 9, 16, 25. But the unequilateral, that is, the long, numbers are everywhere even numbers—6, 12, 20, and the rest similarly, because in creating them the even number multiplies the next odd number or the reverse.[13]

[vi] That these numbers have been constituted either even (when they are also called females) or odd (when they are adjudged males) derives, however, from their own particular root as from their seed. For the fact that four is accounted equal and feminine follows from the fact that 2 is similarly even and feminine; and 2 is the seed of 4, for doubling in itself, namely 2x2, it generates 4. Similarly 9 is both odd and masculine on account of the 3 that is its seed and root. Furthermore, if an even is in the root, when it multiplies an odd or the reverse, it makes an even, as 2x3=6, 3x4=12; likewise 3x6=18, which is oblong. Therefore, all unequilateral long numbers for this reason are both feminine and even, being constituted from feminine evens; but the oblongs are both even and odd (but exceedingly unequal).[14]

[vii] The odd numbers naturally excel the even, however; for the

moveris novenario, conficies 16 longitudine pariter et latitudine quadrupes.[7] Quater enim 4 = 16, similiterque deinceps. In his plane semper impar subditur praecedenti vel impari numero vel saltem ex duobus imparibus constituto, semper unitate duce. Haec enim ita dux est imparium aequilaterorumque numerorum, sicut duitas parium[8] quidem numerorum figuram vero velut inaequilateram componentium.

[iv] Est enim duitas quasi primum inaequilaterum, siquidem primus est discessus ab unitate omnium aequalissima. Itaque [141r] bis unum existit duo. Haec sane duitas latitudine quidem unum est, longitudine vero duo. Re autem vera Pythagorici duitatem indeterminatum aliquid esse volunt, nullius figurae principium. Nam circularis quidem figurae principium esse putant unum, quia convertitur in se ipsum—semel enim unum vel etiam semel unum semel dumtaxat existit unum—trinitatem vero rectilinearum principium figurarum. Est enim primus trigonus ipse ternarius et triangulus rectilinearum figurarum prima, trianguli vero quadrata reliquaque componunt.

[v] Sed haec alias. Redeamus ad institutum. Exponantur ergo pares quilibet deinceps numeri: 2, 4, 6, 8, 10, 12, ceterique similiter. Compone cum 2 4, efficies inde 6. Item cum hoc senario compone senarium, inde 12 reportabis. Item 12 et 8 compone, facies inde 20. Erunt igitur consequenter longi numeri 6, 12, 20, eadem quoque ratio in sequentibus. Aequilateri quidem numeri consequenter pares erant et impares: quatuor, 9, 16, 25. Inaequilateri vero, scilicet longi, sunt ubique pares[9] numeri: 6, 12, 20, ceterique similiter, quia in eis creandis par[10] proximum imparem vel e converso multiplicat.

[vi] Quod autem hi numeri constituti vel pares sint, qui dicuntur et feminae, vel impares, qui et masculi iudicantur, id ex radice quadam sua velut semine provenit. Nam quaternarius in ratione pari feminaque sequitur binarium parem similiter atque [151v] femininum, qui et semen est quaternarii, nam geminans[11] in se ipso—scilicet bis 2—generat quaternarium; similiter novenarius et impar et masculus propter ternarium semen eius atque radicem. Quinetiam si in radice sit par, multiplicans imparem vel e[12] converso facit parem, ut bis 3 = 6, ter 4 = 12,[13] item ter 6 = 18 qui est oblongus. Hac itaque ratione omnes in-

7. quadrupes *scripsi* quadruples Y quadrupres M quadruplos Z 8. partium Z
9. erant et impares . . . ubique pares] *rep.* M 10. par *om.* Z 11. germinans M
12. e *om.* Y 13. 16 YM

even seem to be like corporeal and divisible things, but the odd like incorporeal and indivisible things. Again, the first even, namely 2, is the first division and diversity, and the first fall from the 1. But the first odd, that is 3, is as it were the return to the one and to [its] principle;[15] it abounds in the one more than the even [2] does, and on account of this obvious copiousness it is called masculine. But the even [2], on account of [its] dearth, partition, and fall, appears as it were to be feminine. The human and moral praise is given to the even numbers insofar as there is a just distribution in their partition on both sides. But the more sacred and divine praise is extended to the odd numbers, since in the even number justice has been broken up as it were and has no hinge on which it might depend. But in the odd number there is always the one: it is the mean between the number's even parts on either side. It is as it were the center and the god by whom equal distribution is governed and to which it is referred as to its end.[16]

[viii] Among all odd numbers 3, 7, and 9 seem to be eminent. For in the three the one exists equally on either side around the three's mean, that is, the one, just as the simple and divine beings exist around the divine being or God. Therefore God rejoices in the 3. In the 7 the 3 (which is consecrated to the divine) exists on either side of the one, which is divine. Finally, in the 9 the one, as the divine so to speak, inserts itself as a mean into justice, that is, into the 8. For 8 is named justice by the Pythagoreans because of its perfectly equal distribution.[17] In short, the odd number, because of [its] mean, possesses the bond of itself within; because of [its] center, is circular; and because of the relationship of [its] extremes to [its] mean, is the principle [or cause] of the universal order.[18]

Chapter 7. The trigon numbers, which are composed from even and odd numbers successively. And how the square may be made from trigons.

They call the numbers trigons which are composed from both odd and even numbers arranged in succession.[1] Thus, if you add the even two, like a workman's square,[2] to the one, as to an odd number possessing the trigonic power in itself, you will make the trigon, that is, the triangle, namely the three. If then you add the three—the next number to follow—straightway you will obtain the trigon six. Again when the four has been added, the ten will be generated, itself a

aequilateri scilicet[14] longi et feminae sunt et pares, ex paribus videlicet feminis constituti, oblongi vero sunt pares[15] et impares sed nimium inaequales.

[vii] Simpliciter autem impares numeri praestant paribus. Pares enim rebus corporeis atque dividuis, impares autem incorporeis individuisque similes esse videntur. Item par primus, scilicet duitas, est divisio diversitasque prima casusque primus ab uno. Primus autem impar, id est ternarius, est quasi reditus ad unum atque principium; atque ultra parem abundat uno, ob quam plane copiam masculus appellatur. Par autem ob inopiam, partitionem, casum quasi femininus apparet. Parium quidem numerorum humana laus est atque moralis quatenus in eorum partitione iusta[16] utrinque fit distributio. Imparium vero sacratior laus est atque divina, siquidem iustitia in ipso pari quasi dissoluta est, nec ullum habet cardinem quo nitatur. Sed in ipso impari semper ipsum unum: inter partes[17] numeri utrinque pares est medium, quasi centrum atque numen quo aequa distributio[18] regitur[19] et ad quod refertur quasi[20] finem.

[viii] Inter omnes vero impares 3, 7, 9 eminere videntur. Nam in 3 circa medium eius, id est unum, utrinque extat pariter unum, quasi simplicia et divina circa divinum sive Deum. Ideo Deus ternario gaudet. In septenario circa numen unum utrinque ternarius existit numini consecratus. Denique in novenario ipsum unum quasi numen iustitiae, id est octonario, se medium inserit; nam octo propter aequalem ad ultimum distributionem a Pythagoricis iustitia nominatur. Summatim vero impar et propter medium sui ipsius vinculum in se possidet, et propter centrum circularis existit, et propter comparationem extremorum ad medium universi ordinis est principium.

Numeri trigoni qui ex paribus deinceps et imparibus componuntur, et quomodo ex trigonis fiat quadratum. Cap. VII.

Numeros vero trigonos nuncupant qui ex imparibus simul atque paribus consequenter dispositis componuntur. Itaque, si unitati velut impari virtutemque in se trigonicam possidenti subdas duitatem parem velut normam, efficies trigonum, id est, triangulum ipsum, scilicet

14. scilicet *om.* Z 15. sunt pares] et pares sunt M 16. iuxta M
17. pares YZ 18. distributo Y 19. requiritur M 20. quas M

trigon. These then are the trigons in the order of succession—3, 6, 10, and so on similarly.[3] But as in figures two triangles make one square, so in numbers also two [adjacent] trigons make a square number. Thus the one (a trigon in power as it were) along with the three (itself a trigon) make the square 4. Similarly 3 and 6 (trigons both) generate the square 9. In the same way the trigons 6 and 10 together make the square 16.[4] For if you explore diligently, everywhere you will discover that the powers and properties of numbers are preserved in planes and in figures. So why be amazed that the same powers and properties extend by gradations through planes to solids, and thus that all bodies come into being and are moved by their numbers? Wherefore Plato here and everywhere attributes all things to numbers.[5] And Plotinus and Proclus prove most subtly that numbers exist in the prime being itself as the first distinguishers there both of beings and of ideas.[6] Consequently it is not to be wondered at that lower things too are distinguished through numbers, and that, just as the species of things all wield their particular powers, their prerogatives and privileges as it were, so do the species of numbers do the same.

Chapter 8. The one, the odd and even numbers, and the equilateral and unequilateral.

The one, the principle of numbers and dimensions, seems most like the principle of the universe, because, while it procreates all its offspring, it stays meanwhile most eminent and most simple. From the one, however, dimensions proceed from a position as it were of the point and of points; and numbers flow on as if with their own particular motion, although the even numbers flow more in procession, the odd mostly in conversion.[1] Nevertheless, the one, which depends on the One, is the substance of numbers insofar as each number perhaps is nothing other than the one repeated so many times.[2] Furthermore, the one is the measure itself of numbers. For 1x2 is the two; 1x3 similarly is the three; and so forth with the rest of the numbers similarly. Moreover, just as incorporeals and bodies alike are made from the one principle of things, so the odd and even numbers are made from the one. Likewise, just as simple things and composites are made from the one principle, so simple and compound numbers are made from the one. The simple numbers are those which simply consist of and are measured by the one—as 3, 5, 7, and the like; but compound numbers are those which are measured additionally by a number smaller

ternarium. Si deinde trinitatem subieceris consequentem, mox senarium trigonum reportabis. Rursus addito quaternario denarius et ipse trigonus generabitur. Hi sunt igitur deinceps trigoni consequentes: 3, 6, 10, similiterque deinceps. Quemadmodum vero in figuris trianguli duo quadratum unum[1] efficiunt, sic et in numeris duo trigoni numerum quadratum faciunt. Itaque unitas quasi quidam virtute trigonus simulque ternarius et ipse trigonus quadratum conficiunt quaternarium. Similiter 3 et 6 ambo trigoni quadratum procreant novenarium. Eodem pacto 6 et 10 trigoni quadratum 16 simul faciunt. Enim vero si diligenter exploraveris, comperies ubique numerorum[2] vires[3] proprietatesque in planis figurisque conservari. Quid ergo mirum easdem per plana gradatim in solida pervenire, atque ita corpora suis quaeque fieri numeris atque moveri? Quapropter Plato hic et ubique numeris omnia tribuit. Et Plotinus Proclusque subtilissime probant numeros in ipso ente primo tanquam primos distinctores entium illic[4] idearumque existere, ut non mirum sit per numeros inferiora quoque distingui, atque sicut et rerum sic et numerorum species omnes suis quibusdam viribus quasi praerogativis privilegiisque pollere.

Unitas, impares paresque numeri, aequilateri et inaequilateri. Cap. VIII.

Ipsum unum numerorum dimensionumque principium videtur principio universi simillimum, quoniam, dum sua omnia procreat, eminentissimum interea permanet atque simplicissimum. Ab hoc autem et dimensiones quasi quadam puncti punctorumque positione procedunt, et numeri quasi suo quodam motu profluunt, tametsi pares quidem potius processione quadam, impares autem conversione potissimum. Interea unitas ab uno dependens est et substantia numerorum, quatenus unusquisque numerus forte nihil aliud est quam unitas totiens repetita; est insuper et [1419] numerorum unitas ipsa mensura. Semel enim duo est ipsa duitas; semel tria similiter[1] est ipsa trinitas; ceterique similiter deinceps numeri. Praeterea, sicut ab uno rerum principio incorporea fiunt atque corpora, sic ab unitate impares atque pares. Item sicut[2] ab illo simplicia compositaque, ita et ab hac numeri simplices et

1. unum *om.* M 2. numerum Z 3. iures Y 4. illhinc M

1. similiter *om.* M 2. sicut] si ut Y

than themselves—as 4 by the 2, 6 by the 2 and the 3. The one is like the maker of the world; but the two is like indeterminate matter, as Archytas says.[3] Archytas wishes the one to be the idea of odd numbers, the two of even; and the two to be not so much a number as the first fall from the one. The first number he wishes to be the three.[4] This is like the mystery of the Christian Trinity. Moreover, the one is not one of the numbers because of [its] most simple eminence; and it is all the numbers because it has the effective power of all numbers.[5] For this reason, therefore, it has no parts and it is neither an even nor an odd number. Insofar as it adds itself to a number already born an even, and renders it odd, it seems odd itself. Again, insofar as it accommodates itself to a number born an odd and makes it even, it appears even again.[6] This Aristotle says in the *Pythagorean*,[7] although the Pythagoreans [themselves] were more willing to call the one an odd.[8] For it is proper for an even number not to change the number it is added to: if it is added to an even, it preserves it as an even; if to an odd, it preserves it as an odd. When the one meets an even number, on the other hand, it makes it an odd; and when it meets an odd, it makes it an even. In the same way, the odd number—as the male and effective number—changes the number it meets: out of an even number it makes an odd, out of an odd it makes an even. However, the even number—as the female—does not change; rather it is itself changed and itself suffers. Therefore the odd numbers seem to have greater kinship with the one, and this is because they are indivisible in a way, and yet they abound: they always have the one in themselves as [their] mean and center, and from the beginning they end in and are converted to the one.[9] Finally, after you have divided an even number, it seems entirely torn apart, nor does anything of it survive among its parts. But when you study to divide an odd number, the one exists among that number's divided parts as its indivisible link, so that the odd number seems to be unfolded rather than divided.[10] But the one is entirely indivisible. For what is divided is cut into lesser parts. But the one cannot be cut into anything less than one. On the contrary, when it appears to be divided, it is doubled rather. But the one is the principle of identity, equality, and likeness, and in these with some justice it is able to resemble God.[11]

[ii] Wherefore squares, which are always equilaterals,[12] are more like the one than unequilaterals because of [their] equality and straightness, the [attributes] most closely associated with the one. For in squares both the lines and all the angles have equality, mutual likeness,

compositi: simplices qui unitate simpliciter constant atque mensurantur, ut 3, 5,[3] 7 atque similes; compositi vero qui insuper quodam minori numero mensurantur, ut 4 binario, 6 binario atque ternario. Unitas quidem similis est opifici mundi, duitas vero materiae indeterminatae, ut inquit Archytas, qui unitatem impa[152r]rium ideam esse vult, duitatem vero parium;[4] et hanc non tam numerum quam primum ab uno casum, numerum vero primum esse ternarium. Mysterium Christianae trinitati simile. Iam vero unitas et propter simplicissimam eminentiam nullus[5] est numerorum, et propter virtutem omnium efficacem est[6] omnes numeri. Qua igitur ratione nullas habet partes, nec par est nec impar; qua vero se adhibet numero pari iam nato imparemque reddit, videtur impar; qua rursus impari genito se accommodans facit parem, par rursus apparet. Id quidem Aristoteles inquit in *Pythagorico*, quamquam Pythagorici unum libentius impar appellaverunt, quia paris proprium sit non mutare numerum cui additur. Nempe si addatur pari, parem[7] servat; si impari, imparem. Unum vero contra obvium quidem pari, facit[8] imparem; obvium autem impari, reddit parem. Similiter et numerus impar tanquam mas et efficax numerum accessu mutat: ex pari quidem facit imparem, ex impari vero parem. Numerus vero par ceu femina non mutat,[9] sed permutatur et patitur. Numeri ergo impares maiorem cum unitate cognationem[10] habere videntur, quia et quodammodo sunt individui nihilominusque abundant, et unum ipsum semper habent in se medium atque centrum, et ab initio in unum desinunt atque convertuntur. Denique postquam numerum parem diviseris, videtur omnino divulsus[11] nec inter eius partes eius aliquid extat; cum vero imparem distribuere studes, inter partes eius digestas existit unum, eius insolubile vinculum, ut explicatus potius videatur quam divisus. Unum vero est prorsus indivisibile. Quod enim dividitur, in minora secatur; unum vero in aliquid uno minus secari non potest, immo vero[12] cum videtur dividi potius geminatur. Est autem unum identitatis et aequalitatis similitudinisque principium, in quibus Deo simile videri non iniuria potest.

[ii] Quapropter quadrata semper aequilatera similiora sunt uni quam inaequilatera propter aequalitatem et rectitudinem uni quam

3. 6 Z 4. partium Z 5. nullius MZ 6. et Z 7. parem] scilicet parem M 8. faciet M 9. mutatur Z 10. cognitionem Z 11. dividuus M 12. immo vero] uno vero in aliquid uno minus secari non potest, uno vero *per homoioteleuton* M

and straightness.[13] But the excellence in equilaterals is other;[14] for it is by the gift of the one that they overcome the unequilaterals. For the seed of the equilateral is the one;[15] and, while the seed remains in its unity or doubles,[16] from it sprouts the square. Thus the two duplicated by way of itself makes 4. The three multiplied by way of itself creates 9, and the 9 is that much more excellent than the 4 in that the 3 that is its seed is more outstanding than the 2. But the seed of the unequilateral has been divided into two and does not remain but is transferred from one [number] to another: thus 2 multiplied by 3 or the reverse makes the unequilateral 6.[17]

[iii] Finally, the one itself for the same reason too has a marvelous likeness to God, the absolutely most simple, because, however much you try to multiply and say 1x1 or again 1x1x1, you never divide or diminish or increase the one itself. In numbers too there is a likeness to God Himself. For any one number working with itself generates a number, for example, 2x2=4, 3x3=9; and after it has given birth to the number, it generates another by way of this generated number; for example, 2x4=8, 3x9=27. Furthermore, the number that is the author, by using itself alone—and not using as its instrument [this generated number]—can produce the same number that it produced when using the instrument; for instance, 2x2x2=8, 3x3x3=27.[18] From this it appears that God acting in Himself procreates other things.[19] And in fact, if He uses the prime creature as the means to produce other effects, He can nonetheless procreate the same effects without this means, acting likewise in Himself. There are many other likenesses, but these may presently suffice for us, if I refer, that is, to the Pythagorean saying: As all things after God consist of a property of God Himself along with a degeneration from Him, and consist moreover of the same and difference and of unity and multiplicity, so too are numbers with regard to the one.[20] Wherefore as the first number—not, I repeat, as the first multitude but as the first number—three is made from the one and from the two (i.e., from the two as a degeneration of the one, as otherness, as confused multitude). Similarly the rest of the numbers seem to follow this fate of the first number.[21]

proximam. In his enim et lineae et anguli omnes aequalitatem et similitudinem invicem habent atque rectitudinem. Est et alia aequilateris excellentia, ipsius videlicet unitatis munere quo inaequilatera superant. Nempe semen aequilateri unum est, ac, dum in sua permanet vel geminat unitate, pullulat inde quadratum. Ita duitas per se duplicata facit quatuor; trinitas per se multiplicata creat 9. Ipseque novenarius tanto est excellentior quaternario quanto ternarius eius semen praestantius est binario. Inaequilateri vero semen divisum est in duo neque permanet, sed alterum migrat in alterum. Ita 2 in 3 multiplicatum vel converso senarium inaequilaterum[13] efficit.

[iii] Denique ipsum unum mirabilem hac quoque ratione similitudinem habet ad Deum simpliciter simplicissimum, quia quantumcumque multiplicare contenderis, dicens semel unum item semel unum semel,[14] nunquam vel dividis vel minuis vel auges ipsum unum. Est etiam in numeris similitudo quaedam ad ipsum Deum, quilibet enim numerus agens secum ipso generat numerum, ut bis 2 = 4, ter tria = novem; et postquam genuit per genitum numerum[15] generat alium, ut bis 4 = 8, ter 9 = 27. Potest quinetiam ille numerus auctor sine hoc instrumento eundem per se numerum producere, quem hoc instrumento produxerat, ut bis duo bis = octo, ter 3 ter = 27. Ex his apparet Deum secum ipso agentem alia procreare; necnon si creatura prima utatur ut media ad effectus[16] alios producendos, posse nihilominus eosdem sine hoc medio procreare agendo similiter secum ipso. Sunt et aliae multae similitudines, sed hae[17] nobis in praesenti sufficiant, si retulero videlicet Pythagoricum illud: Quemadmodum post Deum omnia ex quadam ipsius Dei proprietate una cum quadam illinc degeneratione constant atque ex eodem simul et altero et unitate atque multitudine, ita numeri se habent ad unum. Quapropter ternarius tanquam primus numerus—non inquam multitudo prima sed numerus primus—ex unitate fit atque duitate quadam unitatis degeneratione atque alteritate confusaque multitudine.[18] Similiter ceteri numeri hanc numeri primi sortem sequi videntur.

13. inaequilaterum *scripsi* quadratum YMZ 14. semel *om.* Z 15. genitum numerum] genitus numerus M 16. affectus Z 17. haec Z 18. in multitudine Z

Chapter 9. Odd numbers comprehend the even. Likewise the equilateral contain the unequilateral.

The odd numbers are not comprehended by the even, but rather the odd comprehend the even. For instance, the three contains the two in itself in that the one, which is the mean in the three and so to speak its head and bond, contains the two around itself. Plainly in the three there are three terms or grades, and two intervals are included in the three. Similarly, the four is in the five; for twin twos are on either side of the one, the five's mean, and between the five terms are four intervals. Similarly, the six is contained in the seven. And any even number preceding an odd number in the [numerical] order is comprehended by that next odd number as in [its] whole or end. Indeed, no order ever appears at all except by way of the odd terms: in them the one is the mean, the hinge so to speak, and the terms are even and the intervals are even on either side of it.

[ii] Just as the odd numbers contain the even, so the equilateral numbers, which are all compounded from the odd numbers, comprehend the unequilateral, which are all procreated from the even.[1] The first equilateral compounded is 4, the second 9. The proportional mean between these is the unequilateral 6. For the proportion from 9 to 6 is in the ratio of 3:2. The like proportion also pertains from 6 to 4. The third equilateral is 16, for it is the result of 4 led to itself, just as 9 is the result of 3 [led to itself], and 4 of 2. Between 16 and 9 the proportional mean is 12, which is unequilateral; for it is the result of 3 led to 4. But just as the proportion between 16 and 12 is in the ratio of 4:3, so between 12 and 9 it is also in the ratio of 4:3. Therefore in these the unequilaterals seem to be enclosed by the equilaterals.[2] But this is not the case with the contrary situation. Certainly 6 and 12 are unequilaterals. The mean between them is the equilateral 9. Yet this does not have the like proportion to the two extremes; for 12 to 9 has the proportion in the ratio of 4:3, but 9 to 6 that in the ratio of 3:2. Therefore 9 is not bound fast by these [its two unequilateral extremes]. In subsequent numbers the like reason also prevails.[3]

[iii] I said a little earlier that the equilaterals are compounded. Moreover, among the Pythagoreans the one is equilateral, although simple; for 1x1=1. Between 1 and the equilateral 4 is the unequilateral 2. For just as from 4 to 2 the proportion is in the ratio of 2:1, so is it from 2 to 1. Therefore the equilaterals [1 and 4] encompass and bind fast the unequilateral [2].

Impares numeri compraehendunt pares. Item aequilateri inaequilateros continent. Cap. VIIII.

Impares numeri non compraehenduntur a paribus sed compraehendunt, ut ternarius binarium in se continet, siquidem in ternario unitas quidem media quasi caput et vinculum binarium circa se continet. Tres plane in ternario termini sunt vel gradus; intervalla duo contenta ternario. Similiter in quinario quaternarius; nam et circa medium eius unum geminus est hinc et inde binarius, et inter quinque terminos intervalla sunt quatuor. Similiter in septenario senarius continetur. Et par quilibet ordine praecedens imparem in[1] proximo impari tanquam toto vel fine compraehenditur.[2] Iam vero nullus usquam apparet ordo, nisi per terminos impares, in [1420] quibus unus sit medius quasi cardo et utrinque pares termini et intervalla sint paria.

[ii] Quemadmodum vero impares numeri pares continent, sic aequilateri, qui omnes ex imparibus componuntur, [152v] compraehendunt[3] inaequilateros, qui omnes procreantur ex paribus. Primus quidem aequilaterus compositus est 4, secundus vero 9. Proportionale inter istos medium est senarius inaequilaterus; nam ab ipso 9 ad 6 sexquialtera[4] proportio est. Similis quoque proportio a 6 existit ad 4. Tertius aequilaterus est 16; fit enim ex 4 in se ducto, sicut 9 ex tribus et 4 ex duobus. Inter 16 atque 9 proportionale medium est 12 qui inaequilaterus est; fit enim ex tribus ductis in 4. Sicut vero proportio inter 16 atque 12 sexquitertia est, ita inter 12 atque 9 est sexquitertia. In his igitur apparet inaequilateros ab aequilateris[5] contineri, neque vero fit vicissim. Nempe 6 et 12 inaequilateri sunt. Inter hos aequilaterus medius est 9. Neque tamen est hinc[6] ad extrema proportio similis; nam 12[7] ad 9 proportionem sexquitertiam habet, sed 9 ad 6 sexquialteram. Ipse igitur 9 non devincitur ab illis. In sequentibus quoque ratio similis.

[iii] Dixi paulo superius compositos aequilateros. Praeterea unum apud Pythagoricos est aequilaterum, licet[8] simplex, semel enim unum = unum. Inter hoc et 4 aequilaterum inaequilaterus est binarius. Sicut autem a 4 ad 2 proportio dupla est, sic a duobus ad unum. Sic igitur aequilateri inaequilaterum continent atque devinciunt.

1. in] et in M 2. compraehendit Z 3. comprehendent M
4. sexquilatera Z 5. ab aequilateris *om.* Z 6. hic Z 7. 12] ad 12 M
8. scilicet M

[iv] But how the double proportion in the ratio of 2:1 along with the proportions in the ratios of 3:2 and 4:3 are all in accord with the perfection and steadfastness of things, this we have described in [our] introductions for the *Laws* and in the *Epinomis*.[4]

Chapter 10. How the diagonal is or is not commensurable to the side.

In squares Plato says that the diagonal is and again is not commensurable to the side. It is commensurable in power, for the power of the diagonal is adjudged double the power of the side. For were you to derive an equilateral square from the diagonal, it would consist of double the square already derived from the side. But the diagonal does not seem to be commensurable to the side in act or in [having] a determinable root. For if the square from the two-foot side is 4, the square produced from the diagonal will be 8. It seems (as I said) that the diagonal is proportional to the side in power. For a different reason, however, the diagonal is adjudged not proportional; this is because the root of the 4 is known, namely 2, but the root of the 8—the 8 as a plane and equilateral number—is undeterminable.[1] For no one number led to itself once makes 8. Similarly, if the square made from a three-foot side is 9 (namely 3x3=9), then the square of its diagonal will be 18. For the power of the diagonal is double the power of the side. In this condition [i.e., of power] they seem commensurable, as I was just saying. Yet they are not commensurable in act, in root, in line.[2] For the root of the 9 is known, that is, the 3 led to itself. But the root of 18 is unknown. For no one number led to itself makes 18. Likewise, if this [the square of the side] is 16, then that [the square of the diagonal] will be 32. The former's seed is certain, namely 4. But the latter's is unknown. The root and seed of a number, however, is properly called that [lesser] number which—having been multiplied by itself and striking root and sprouting as it were[3]—generates the greater number.

Chapter 11. On the mutual multiplication of even numbers and in turn of odd, of equilateral, of unequilateral, and of solid numbers.

If an even number multiplies an even, either itself or another, an even always arises—2x2=4, 2x4=8. Again if an odd multiplies an odd, either

[iv] Quomodo vero proportio dupla, sexquialtera, sexquitertia perfectioni et perseverantiae rerum conveniant, diximus in argumentis *Legum* et *Epinomide*.

Quomodo diameter sit lateri commensurabilis vel non commensurabilis. Cap. X.

Plato in quadratis ait diametrum esse commensurabilem lateri rursusque non esse. Esse quidem virtute; nam virtus diametri ad virtutem[1] lateris dupla censetur. Si enim aequilaterum ex diametro quadratum duxeris, duplum erit ad quadratum iam ex latere constitutum. Non tamen actu vel certa radice commensurabilis lateri diameter esse videtur. Si enim quadratum ex latere bipede factum sit 4, quadratum ex diametro productum erit 8. Qua quidem virtute videtur (ut dixi) diameter lateri proportionalis, sed altera quoque ratione proportionalis non iudicatur quatenus radix quidem quaternarii nota est, scilicet duo, radix autem octonarii ut numeri plani et aequilateri est incerta. Nullus enim numerus semel in se ductus facit 8. Similiter si quadratum ex latere tripede constitutum sit 9, scilicet ter tria = 9, mox quadratum ex huius diametro ductum erit 18. Potentia enim diametri ad lateris potentiam dupla est, qua quidem conditione commensurabilia haec videntur, ut modo dicebam. Non tamen commensurabilia sunt actu, radice, linea. Radix enim novenarii nota est, scilicet ternarius in se ductus. Radix autem ipsius 18 est ignota; nullus enim numerus in se ductus 18 constituit. Item, si illud sit[2] 16, hoc erit 32. Semen illius certum est, scilicet quatuor; huius autem est ignotum. Radix autem semenque numeri ille proprie numerus appellatur qui per se ipsum multiplicatus, quasi coalescens atque germinans, numerum generat ampliorem.

De mutua multiplicatione parium invicem et imparium, aequilaterorum, inaequilaterorum, solidorum. Cap. XI.

Si par numerus parem multiplicet, aut se ipsum aut alium, par semper exoritur: bis duo = quatuor, bis quatuor = octo. Rursus, si impar im-

1. virtem M 2. sit *om.* M

itself or another, everywhere it generates an odd—3x3=9, 3x5=15. But if an even multiplies an odd or an odd an even, everywhere it produces an even—2x3=6, 3x4=12. For this reason surely when an equilateral multiplies an equilateral, either itself or another, an equilateral is born—4x4=16, likewise 4x9=36. And when an unequilateral multiplies an unequilateral, an unequilateral always arises—2x6=12, 6x10=60.[1] But when an equilateral multiplies an unequilateral or the reverse, an unequilateral always arises—4x6=24, likewise 6x9=54.[2] Moreover, if a solid number [i.e., a cube] multiplies a solid, either itself or another, it too will create a solid—8x8=64, 8x27=216.[3] But if an unequilateral multiplies a solid or the reverse, a solid will never be procreated—2x8=16, likewise 8x6=48.

Chapter 12. On the proportions in the powers of the soul; and on spirits, celestial influences, and the causes of immense mutations.

Plato often says that some powers of the soul should be diminished, others increased; and he signifies that all in turn should be composed in musical proportion. Such are the rational, the irascible, and the concupiscible powers.[1] But the reason is twofold—speculative or practical. The former is called the intellect, the latter properly the reason. Therefore, from the onset men should be so educated through discipline that, if we opt for the golden race,[2] the proportion of the understanding to the reason (as 4 to 3) should be in the ratio of 4:3, that of the reason to the irascible power (as 3 to 2) in the ratio of 3:2, and that of the irascible power to the concupiscible (as 2 to 1) in the ratio of 2:1. However, if we opt for the silver race, men should be so educated that the proportion of the reason to the understanding should indeed be in the ratio of 4:3 but reversed, with the reason being 4 but the understanding 3. The musical consonances are contained in these proportions—the diatesseron, diapente, and diapason.

[ii] Similarly through nutrition and the entire diet, the spirit, which comes from blood, should be so composed that in it the air should exceed the fire by the ratio of 4:3, the fire the water by that of 3:2, and the water the earth by that of 2:1.[3]

[iii] Furthermore, if we consider the principal members [i.e., organs], the heart is hot and dry, the liver hot and wet, the brain cold and wet. Heat and wetness are the elements of life. These therefore should overcome the cold and the dry in good measure, but overcome

parem multiplicet vel se vel alium, imparem ubique generat: ter[1] 3 = 9, ter 5 = 15.[2] Sin autem par imparem aut impar parem, gignit utrobique parem: bis 3 = 6, ter quatuor = duodecim.[3] Hac utique ratione ubi aequilaterus multiplicat aequilaterum, vel se vel alium, nascitur aequilaterus: quater quatuor = sexdecim, item[4] quater 9 = 36. Ubi autem inaequilaterus inaequilaterum, semper inaequilaterus[5] oritur: bis 6 = 12, sexies decem = 60. Sed quando aequilaterus inaequilaterum vel vicissim, semper inaequilaterus oritur: ut 4 sex = 24, item sexies 9 = 54. Praeterea, si solidus solidum multiplicaverit, sive se sive alium, solidum quoque creabit: octies octo = 64, octies 27 = 216.[6] Si vero inaequilaterus solidum vel converso, nunquam solidus procreabitur: bis[7] 8 = 16, item octies sex = 48.

De proportionibus in viribus animae et spiritibus influxibusque caelestibus, et de causis ingentium mutationum. Cap. XII.

Plato saepe iubet alias quidem animae vires extenuandas alias augendas, omnesque significat invicem proportione musica componendas. Eiusmodi vires sunt rationalis, irascibilis, concupiscibilis. Sed ratio duplex, speculativa vel practica. Intellectus illa, haec proprie ratio nomi[153r]nantur.[1] Sic igitur ab initio per disciplinam instituendi sunt homines: si aureum genus optamus, ut intelligentiae ad rationem[2] quasi quatuor ad tria sit proportio sexquitertia, rationis autem ad irascibilem velut 3 ad 2 sit sexquialtera, irascibilis ad concupiscibilem ut duo ad unum [sit] dupla; [1421] si autem genus optamus argenteum,[3] [ut] rationis proportio ad intelligentiam sexquitertia quidem sit sed converso ut ratio quidem sit ut 4, intelligentia vero sit ut tria. In his proportionibus consonantiae musicae continentur, diatesseron, diapente, diapason.

[ii] Similiter[4] per nutritionem omnemque dietam spiritus qui fit[5] ex sanguine componendus ut in eo aer[6] ignem sexquitertia superet, ignis aquam sexquialtera, aqua terram dupla.

[iii] Praeterea, si praecipua membra consideremus, cor calidum est et siccum, iecur calidum humidumque, cerebrum frigidum atque humidum. Calor et humor vitae sunt elementa. Haec igitur frigidum sic-

1. ter *om.* YZ 2. 25 Z 3. 16 YM 4. ter Z 5. inaequilaterum semper inaequilaterus *om. per homoioteleuton* M 6. 2016 YM 7. Dies Z

1. nominatur M 2. orationem Z 3. argumentum Z 4. Similiterque Z 5. sit [?] Z 6. aerem Z

coldness more than dryness.[4] For coldness is opposed to heat, dryness to wetness. But heat is more preeminent for life than wetness—it is the craftsman of, or a form so to speak for, wetness.[5] Therefore, when all has been computed, heat in us should perhaps exceed coldness in total power by the proportion of 2:1, wetness exceed dryness by that of 3:2, and heat exceed wetness by that of 4:3. For unless heat were to exceed wetness to a degree, it would never act itself vitally on wetness, nor daily cook the things consumed by us, nor withstand external conditions. Furthermore, in [any] salubrious place, or climate, or season—in all the parts measured together—perhaps heat should exceed coldness in the ratio of 2:1 and wetness in the ratio of 4:3; and wetness should exceed dryness in the ratio of 3:2. Add to these arguments what we have said about such proportions in the introduction to the *Epinomis* with regard to the intervals of the spheres, and the generation of things and the humors of our body.[6] One can find the same tempering too in the planets. But of this in the third book of the *De Vita*.[7]

[iv] If such proportions are dissolved either in us or in the air, either death soon ensues or sudden suffocation threatens. If, because of multiple conjunctions [such proportions] are at variance in the heavens, marvelous fires and floods ensue. On account of these things [and] for the same reason, the favor of the heavens must be captured as far as we are able, so that the influence of Jupiter on us with regard to Venus may be as 4 to 3, the influence of Venus with regard to the Sun as 3 to 2, and the influence of the Sun with regard to the Moon as 2 to 1. For the Sun and the Moon simply bestow life; [whereas] Jupiter and Venus bestow prosperity and increase of life and a profusion of good things.[8] In elections the Moon must be observed therefore as the 1.[9] Then it must be directed to Jupiter in 4 degrees if that is possible, to Venus in 3, but to the Sun in 2.[10]

[v] As long as all proportions and harmonies of this kind prevail among mankind, then a good habit[11] endures in bodies, spirits, souls, and states. But when they fail, that habit also becomes exhausted, and at length the republic changes for the worse. Discipline[12] can do much, but the fatal order[13] seems to determine that when the number 12—the number in which the said proportions and harmonies are first unfolded and which has been destined for the universe—has been changed into its plane [i.e., its square] of 144, then among men a great mutation occurs, which is for the better if our discipline endures; but that when 12 arrives at its solid [i.e., its cube] of 1728, as at its

cumque non parum superare debent, magis vero frigus quam siccum. Frigus enim calori opponitur, humori siccum. Calor sane ad vitam praestantior est humore tanquam artifex vel forma quaedam (ut ita dixerim) ad humorem. Itaque omnibus computatis calor in nobis virtute summatim superare forte debet frigus proportione dupla, humor siccitatem sexquialtera, calor humorem[7] sexquitertia. Nisi enim calor aliquanto excedat humorem, neque aget ipse vitaliter circa humidum, neque quotidie nobis adsumpta concoquet, nec resistet[8] externis. Praeterea in loco, aere, anno salubri, omnibus summatim partibus computatis, calor forte debet dupla frigus excedere, humorem sexquitertia, humor siccum sexquialtera. His adde quaeque[9] de huiusmodi proportionibus in argumento *Epinomidis* circa sphaerarum intervalla rerumque generationem et humores corporis nostri tractavimus. Eandem quoque temperiem in planetis invenire licet. Sed de his in libro *De Vita* tertio.

[iv] Si proportiones[10] eiusmodi in nobis aut aere[11] dissolvantur, vel[12] brevi resolutio[13] sequitur, vel suffocatio imminet repentina. Si propter multiplices coniunctiones in caelo dissideant,[14] incendia mira illuvionesque sequuntur. Quas[15] ob res eadem ratione favor caelestium pro viribus est captandus ut influxus Iovis ad Venerem ceu 4 ad 3 sit in nobis, Veneris ad Solem velut 3 ad 2, Solis ad Lunam sicut duo ad unum. Sol enim et Luna simpliciter vitam praestant; Iupiter Venusque prosperitatem et incrementum vitae bonorumque affluentiam largiuntur. Observanda igitur in electionibus Luna est ut unum; dirigenda deinde ad Iovem gradibus si fieri potest 4, ad Venerem tribus, ad Solem vero duobus.

[v] Quamdiu proportiones harmoniaeque omnes huiusmodi in genere hominum plurimum perseverant, permanet in corporibus, spiritibus, animis, civitatibus bonus habitus. His autem[16] deficientibus, ille quoque fatiscit, tandemque in deterius res publica permutatur. Prodest quidem disciplina multum, sed fatalis ordo destinare videtur ut, quando numerus 12, in quo primo[17] proportiones[18] harmoniaeque huiusmodi explicantur et qui destinatus est universo, in suum planum fuerit permutatus 144, magna quaedam in hominibus permutatio fiat, et haec quidem disciplina perseverante sit[19] in melius; quando vero pervenerit ad solidum velut summum finemque suum 1728, res pub-

7. humorum Z 8. resistit Z 9. quaeque *scripsi* quae quod YM quae quoque Z 10. proportionem YZ 11. in aere Z 12. vel *om.* Z 13. res solutio Z 14. dissideat Z 15. Quod Z 16. autem *om.* M 17. prima Z 18. proportio YZ 19. fit YM

highest end, then the republic, the state itself—if the discipline has endured thus far—also attains to its highest end; and that thereafter gradually it declines by the fatal law to a worse condition, even as the discipline by the same fate also degenerates little by little. However, before these limits have been reached, if the discipline fails through our negligence or infelicity, then the public form totters that much earlier, brought low not only by a particular fate but also by our imprudence.

[vi] In the fifth book of the *Politics* Aristotle briefly described the cause of such a mutation without entirely denying it. He writes:

> The cause of mutations, Plato says, is because nothing endures, but all are changed in a certain cycle. He says that the principle of mutations is among those things "whose root in the ratio of 4:3 when joined to the 5 furnishes two harmonies." He is saying in effect "when the description of this number becomes solid," since nature produces at times worse or better men than discipline produces. In fact, perhaps this has not been badly said.[14]

These are Aristotle's words. *Among those things* . . . , that is, among either the classes of numbers or the compounds of things.[15] *Whose* etc. . . . , that is, among the numbers in which those proportions, which are contained in the twelve, supply two harmonies (the kind we have said), the elements of the diapason.[16] *He is saying in effect "when* . . . , that is, the beginnings of the mutations occur when the 12 by its multiplication attains first the equilateral which is its plane [i.e., 144] and then reaches all the way to [its] solid [i.e., to 1728]. These matters and the rest have been explained in earlier chapters.

Chapter 13. On good or bad offspring through the observance of numbers and of figures.

The Pythagorean and Platonic view is that from two good parents is born an entirely good offspring, from two bad an utterly bad; from a bad and good together an offspring that is not wholly bad indeed, but never good.[1] Likewise the view is that the odd numbers are in the order of the good and should be called males and bridegrooms and fathers (especially because of the strength which they possess in their middle knot, namely the one); but that the even numbers, when compared with the odd, are in the class of the bad and should be called females and brides and mothers—if, that is, they are joined to the odd numbers. For within each class too numbers can be called in a way grooms or brides, since a more outstanding even number can be

called the groom for an inferior even number, and an inferior odd number can be called the bride for a superior one.

[ii] Therefore, since equilaterals are made from the odd numbers (with the one leading), but unequilaterals are born from the even numbers (with the two leading), the equilaterals are certainly deemed the children of the good, the unequilaterals the children of the bad. But trigons, since they arise from the even and odd numbers compounded together, are thought to be not the worst offspring and yet not good offspring. Similarly, from equilaterals multiplied either by themselves or by each other, as from couples already good, good offspring are born. Bad offspring, however, are born from unequilaterals. From solids [i.e., cubes] doubtless come good offspring. From the mixture of unequilaterals with solids good offspring are never born.

[iii] Pythagoras and Plato seem to use these metaphors especially in the propagation of men; and this Iamblichus and Boethius indicate.[2] Plato chooses in generation to have the most choice parents on both sides, those who possess, like the one, an utterly unitary power, and are, in the manner of the odd numbers, indissoluble, strong, well ordered, fertile.[3] Plato also wants them to have, in the manner of equilaterals, an equable and virtuous complexion so that a most honorable progeny might thence arise. For from parents who find themselves in the contrary condition Plato supposes there arises a base offspring; and from mixed parents there springs a stock that is not honorable.

[iv] Therefore, since Plato had here adduced the great number—the number wherein exist the odd and the even numbers, the equilaterals and the unequilaterals, the oblongs, planes, solids, and lateral and diagonal numbers, and the better and worse consonances too (if the [better] diapente is compared to the [worse] diatesseron) and likewise the best harmonies (if the diapason is united with them)[4]—then it is proper for him to have also added that this universal geometric, that is, proportional number has an immense power in itself to produce both good and not good progeny. Over and beyond such metaphors, however, we should observe the likeness of numbers in the ages of the world and in human ages. For, as I have signified elsewhere,[5] in these ages when we arrive at the praiseworthy number or at its opposite,[6] then comes the opportunity for good, or the occasion for evil.[7] From the former springs fecundity and good propagation; from the latter sterility or bad issue.

siquidem par praestantior ad deteriorem parem[5] sponsus dici potest, atque deterior[6] impar ad potiorem sponsa.

[ii] Cum igitur ex imparibus unitate duce aequilateri fiant, ex paribus autem duce binario nascantur[7] inaequilateri, nimirum illi quidem filii boni, hi vero mali censentur. Trigoni[8] autem, quoniam ex paribus simul imparibusque compositis oriuntur, proles quidem non pessimae neque tamen bonae putantur. [1422] Similiter ex aequilateris vel per se vel invicem multiplicatis tanquam sponsis[9] iam bonis proles bonae nascuntur, inaequilateris autem malae. Ex solidis proculdubio bonae; ex mixtura inaequilaterorum cum solidis nunquam bonae.

[iii] His utique translationibus Pythagoras et Plato in propagatione hominum uti videntur; quod Iamblichus Boethiusque significant. Optat Plato electissimos utrinque in generatione parentes, qui instar unitatis vim habeant prorsus unitam, et more imparium indissolubiles sint, robusti, ordinati, fecundi; aequilaterorum quoque conditione aequalem et rectam complexionem habeant ut generosissima inde progenies oriatur. Nam ex aliis qui opposita conditione se habeant pravam oriri stirpem putat;[10] ex mixtis autem pullulare non probam.[11]

[iv] Cum igitur magnum hic Plato numerum adduxisset—in quo impares sint et pares, aequilateri, inaequilateri, oblongi, plani, solidi, laterales, diametrales, consonantiae quoque potiores atque deteriores (si diapente ad diatesseron comparetur), item harmoniae potissimae (si cum his diapason conferatur)—merito subiunxit universum hunc numerum geometricum, id est proportionalem, magnam in se vim habere ad prolem bonam atque non bonam. Ultra vero translationes eiusmodi observare oportet numerorum similitudinem in temporibus mundi aetatibusque humanis. Nempe, ut alibi significavi, quando in his ad laudatum pervenitur numerum vel ad oppositum, aut opportunitas est ad bonum, aut occasio fit ad malum; et illinc quidem fecunditas et propagatio bona, hinc autem sterilitas vel successio mala.

5. partem Z   6. deteror Z   7. nascuntur Z   8. Trignoni Y
9. spontis Z   10. putant Z   11. probant Z

Chapter 14. How the numbers here assigned by Plato are in accord with the firmament, the planets, and the elements.

In the ninth book of the *Republic* Plato reveres the 3 as divine; likewise the square made from the 3, namely 9; and again the solid conceived from it, namely 27. Finally he reveres that great and fatal number, namely 729.[1] This is because it has the prime root 3, the second root 9, and finally the third root 27. For it is made on the one hand from 9 increased by itself thrice, and on the other from 27 increased by itself twice, and both these numbers are resolved into the three. Furthermore, 729 is solid and circular[2] and in accord, as we say, with the celestials.[3] But in this eighth [book] Plato is about to signify a greater destiny. He takes up the greater number 1728, which is procreated from the 12 thrice increased. Perhaps he wishes the 1000 hidden away in this number to signify the firmament hiding in a way in the stars. Then from that great number which is the multiple of twelve thrice increased, namely from that number 1728, in the first place he chooses, and chooses openly, the 100 celebrated in the tenth book of the *Republic*,[4] because that equilateral 100 is procreated from ten, from the universal number as it were led to itself. Similarly, he leads the 100 to itself, multiplying the 100 a hundred times. The result is that squared equilateral number of 10,000 celebrated in the *Phaedrus*.[5] For from the ample equilateral [of 100] the still more ample equilateral is thus produced. Either square [i.e., 100 and 10,000?] corresponds to the stars—the strictly fixed stars—which are in the firmament, so that not unjustly it [the equilateral?] was chosen at the onset.[6]

[ii] From that great number accepted previously there remains, therefore, 728, which is unequilateral and therefore not {only} long but oblong {besides}.[7] For 700 is incontrovertibly oblong and indeed totally so, since its width is 7 and its length 100. If you add 28 to this oblong, it will still be an oblong. But having chosen this oblong, Plato straightway selected a twin 100 from it, the one being diagonal, the other solid. For anyone is permitted to suppose 100 diagonal and equilateral numbers in order, also 100 other numbers in order, solid ones.[8] In the meantime however he increases this number [of 100] to the numberless crowd,[9] having the reason which we declared from the beginning. Certainly he increases the diagonal numbers to the numberless crowd,[10] and the solids similarly (if from increasing solids you make solids in succession).[11] But if in the succession of numbers

Quomodo numeri hic a Platone assignati conveniant firmamento et planetis atque elementis. Cap. XIIII.[1]

Plato in nono de *Re Publica* ternarium colit quasi divinum; item quadratum ab eo factum, scilicet 9; rursus solidum ab ipso conceptum, scilicet 27; denique magnum illum numerum et fatalem, scilicet septingenta 29,[2] quia primam radicem habet tres,[3] secundam vero novem, tertiam denique 27. Fit enim partim quidem ex 9 per se ter aucto, partim etiam ex 27 bis per se aucto,[4] qui in ternarium resolvuntur; et solidus est atque circularis caelestibusque conveniens ut dicemus. Sed in hoc octavo ampliora fata[5] significaturus, numerum accipit ampliorem 1728 ex duodenario ter aucto procreatum, in quo quidem ipsum millenarium latenter inclusum forte vult firmamentum ipsum in stellis quodammodo latens significare. Mox vero ex magno illo numero multiplicato per duodenarium ter auctum, scilicet ex numero illo 1728,[6] palam seligit imprimis centenarium unum in decimo de *Re Publica* celebratum, quoniam ex denario, quasi universo numero in se ipsum ducto, aequilaterus procreatur.[7] Ipsumque centenarium ducit similiter[8] in se ipsum, multiplicans videlicet centum centies, unde conficitur quadratus numerus aequilaterus decem millia celebratus in *Phaedro*. Sic enim ex amplo aequilatero aequilaterus amplior procreatur. Quadratus uterque stellis proprie fixis quae sunt in firmamento respondet ut non immerito[9] selectus[10] principio fuerit.

[ii] Restat igitur ex magno numero prius accepto 728 qui inaequilaterus est. Nec solum propterea longus, sed insuper est oblongus; nam septies centum extra controversiam est oblongus et quidem maxime, quippe cum latitudo quidem eius sit septem, longitudo vero centum. Si[11] huic oblongo addideris 28, nihilominus oblongus erit. Sed cum elegisset hunc oblongum, mox ex illo centum excerpsit geminum: unum quidem diametrale,[12] alterum vero solidum. Cuilibet enim licet excogitare numeros ordine centum diametrales[13] et aequilateros, centum quoque alios ordine solidos. Sed interim in turbam innumerabilem[14] numerus hic excrescit[15] ratione quam ab initio diximus habita: diametrales quidem ad innumerabilem[16] proculdubio, solidi similiter, si ex solidis crescentibus solidos deinceps efficias. Sin autem

1. XIII Y 2. septingenta 29] septingenta novem Y 3. triam YZ 3 M 4. partim etiam . . . se aucto] *rep.* M 5. facta Z 6. 1782 Z 7. procreatum Z 8. simpliciter Z 9. merito Z 10. sed electus Z 11. Si vero M 12. diametralem Z 13. diametrale Z 14. innumerabilium Z 15. excresit Y 16. numerabilem M

you make from any one number its solid, then after you have arrived at the solid made from the 100, you will obtain 1,000,000 (since the plane from the 100 was 10,000).[12] But let us return now to earlier matters.

[iii] That number 700 agrees with the 7 planets subsequent to the firmament.[13] But 28 principally agrees with the Moon, which follows the planets. For the firmament scarcely has proportion with the Moon, or in turn.[14] Therefore, we observe the aspect of the Moon not so much with regard to the sublime stars as to the planets.[15] But even more diligently we should observe the aspect of the planets to the highest stars; for the planets have a similar proportion to the stars as the Moon to them, and as the humor of the elements to the Moon, and [their] heat to the Sun.[16] But principally Saturn has been allotted the gifts of the sublime stars. The equilateral and the even numbers,[17] signified by way of 100x100, are in accord principally with the firmament because of its even, simple, and absolutely circular motion. The unequilateral and the odd numbers, however,[18] are in accord with the planets and the elements because of [their] odd and multiple motion. Among the planets, however, the oblongs[19] accord with Mars, Mercury, and the Moon, the authors of the most and the greatest motions; and among the elements they accord with fire, mainly for the same reason, and with water.[20] Oddness I have placed both in the planets, if we compare the planets to the firmament, and in the elements, if we compare the elements to the planets. Otherwise it is the even numbers which accord with the great spheres of the planets,[21] and with the Sun and the aether because of the evenness of [their] motion, and also with Jove, Venus, and the middle air because of the tempering of [their] qualities.[22]

[iv] Furthermore, certain plane and solid numbers are indicated here in the planets.[23] The planets are called solid which have the fullness of their class and are not "referred" in this to another, as is the case with the Sun, Saturn, and Jupiter.[24] Therefore the Sun has the highest fertility of life absolutely. Saturn, however, has the same fertility but in a life that is incorporeal, separate, and divine. Jupiter too has the same fertility but in life and action that is corporeal and human. In the present context Plato is speaking of both kinds of fertility, that is, of bodies and of souls. In the *Cratylus* he calls Jove the fountain of human life, but Saturn the pure and full understanding.[25] In the *Laws* too he declares Saturn the true master of those who have understanding.[26]

in successione[17] numerorum ex quolibet solidum suum facias, postquam perveneris ad solidum factum ex ipso [154r] centum, mille millia reportabis, siquidem planum ex ipso centum fuerat decem millia. Sed ad priora iam revertamur.

[iii] Numerus ille 700 planetis septem convenit sequentibus firmamentum, sed 28 praecipue congruit Lunae sequenti[18] planetas. Firmamentum enim vix proportionem habet[19] cum Luna vel vicissim. Ideo non tam observatur aspectus Lunae ad stellas sublimes quam ad planetas. Aspectus autem planetarum ad stellas altissimas diligentius observandus. Sic enim illi ad illas proportionem habent sicut ad illos Luna, atque elementalium humor ad Lunam et calor ad Solem. Praecipue vero sublimium stellarum munera sortitus est Saturnus. Numeri quidem aequilateri et aequales per centies centum significati praecipue conveniunt firmamento propter motum eius aequalem, simplicem, simpliciter circularem. Inaequilateri vero et inaequales[20] planetis et elementis propter inaequalem multiplicemque motum. Oblongi autem inter planetas Marti, Mercurio,[21] Lunae, mutationum[22] auctoribus plurimarum atque maximarum; inter elementa igni ob eandem causam potissimum atque aquae. Inaequalitatem in planetis posui—si comparentur ad firmamentum—et in elementis—si ad planetas—alioquin aequales numeri sphaeris magnis competunt planetarum et Soli atque aetheri propter motus aequalitatem, Iovi quoque et Veneri[23] aerique medio ob temperantiam qualitatum.

[iv] Designantur hic insuper in pla[1423]netis plani quidam[24] numeri atque solidi. Solidi[25] quidem planetae dicuntur qui plenitudinem sui generis habent atque in hoc ad aliud minime referuntur, ut Sol et Saturnus et Iupiter. Sol igitur summam vitae fertilitatem simpliciter habet. Saturnus autem[26] tenet eandem sed in vita quadam incorporea, separata, divina; eandem quoque Iupiter, sed in vita et actione corporea potius et humana. De utraque fertilitate Plato loquitur in praesentia, corporum scilicet atque animorum. Iam vero in *Cratylo* Iovem appellat humanae vitae fontem, Saturnum vero intelligentiam puram atque plenam, quem in *Legibus* etiam verum dominum iudicat eorum qui mentem habent.

17. successiones M 18. sequentibus Z 19. proportionem habet *tr.* M
20. inaequalis M 21. Mercurii Y 22. motionum Z 23. Veneris Z
24. quadam Z 25. solidae Z 26. enim Z

[v] Among the planets there are four, however, which are planes so to speak insofar as they are "referred" to the solid planets. Mars indeed and the Moon minister to the solidity of the Sun—the Moon to its light, Mars to its heat. Mercury moves with the ingenious gift[27] of Saturn or accompanies it or executes it. Venus agrees with Jove in office.[28] Also among the plane planets, some are called lateral, some diagonal. The diagonal does not have a perfect proportion with the side, rather it doubles the power of the side. Thus the Moon undoubtedly relates to Venus. For Venus begins and stimulates birth, but Lucina [i.e., the Moon] bears the power.[29] Mars similarly relates to Mercury, for he rouses and inflames Mercury's motion. But it is not novel for Platonists to indulge in such metaphors; to the contrary, the *Timaeus* and *Phaedrus* inform us it is necessary.[30] But Plato warns us to observe such influences as these in making judgments and choices; and we have taught the same in the third book of the *De Vita*.[31]

Chapter 15. The observance of certain particular numbers in the great number.

It is worth considering why from that great number, 1728, Plato thrice chooses 100. First, he chooses the 100 as the producer of the equilateral [10,000], that is, insofar as it is led to itself. Second, after he has accepted the unequilateral and oblong number, namely 728,[1] he chooses the diagonal 100 (in the first instance as equal to itself, in the second as a plane[2]). Third, he chooses the solid 100, by name the cube.[3] Why does he also signify the 1,000 and the 10,000? And why did he wish for three terms in describing the fatal number: first the 1000, second the 700, third the 28? Certainly, he meant the three[4] to signify the Fates, appointing the beginnings and ends and middles of things.[5]

[ii] He rejoices perhaps in the 3 as in the first [number], certainly as in the most sacred of all [numbers]. Moreover, he rejoices in the 100 as in the brood of the universal number, that is, of the 10; for 10x10 makes 100. He also introduces this number, the 100, in the tenth book of the *Republic* as if it were life's particular end and the term of judgment.[6] Moreover, in the *Phaedrus* especially he delighted in the 1000 as in the body of the 10, for 10x10x10 makes its own solid the 1000.[7] Again, he rejoices in the 10,000 openly in the *Phaedrus* and secretly here, because it results from 10 and 1000 (in both books meanwhile he reports the unequal dignity);[8] likewise

[v] Quatuor vero sunt inter planetas quasi plani quatenus referuntur ad solidos. Mars quidem atque Luna Solis soliditati ministrant: Luna[27] lumini, Mars calori. Mercurius ingeniosum Saturni munus movet vel sequitur vel exequitur. Venus cum Iove in officio convenit. Sunt etiam inter planetas[28] planos aliqui laterales diametralesve nominati. Diameter proportionem cum latere consummatam quidem non habet, sed lateris duplicat potestatem. Sic utique Luna quidem se habet ad Venerem.[29] Nam Venus partum incohat atque stimulat. Lucina vero fert opem. Mars similiter ad Mercurium, nempe motum eius acuit et accendit. Eiusmodi vero translationibus indulgere Platonicis non est novum, immo et necessarium esse *Timaeus, Phaedrus*que docent.[30] Eiusmodi autem influxus in iudiciis et electionibus observandos Plato monet, et nos in tertio[31] *De Vita* docuimus.

Observantia certorum numerorum in numero magno. Cap. XV.[1]

Consideratione[2] dignum est cur Plato ex illo[3] numero magno 1728 ter eligat centum: primo quidem centenarium aequilateri productorem, quatenus videlicet in se ducitur; secundo, post numerum inaequilaterum et oblongum, scilicet 728, acceperit, centum diametrale (et primo pariter et secundo planum); tertio vero solidum nomine cubum. Cur etiam significet mille atque decem millia et quare in fatali numero describendo terminos tres voluerit: primum quidem mille, secundum vero 700, tertium 28. Profecto tres[4] voluit parcas[5] significare, principia rerum ac fines et media[6] destinantes.

[ii] Gaudet quidem ternario forte tanquam primo, certe velut omnium sacratissimo. Gaudet insuper centenario quasi foetu universi numeri, id est denarii. Decies enim decem[7] facit[8] centum. Introducit etiam hunc numerum, scilicet centum, in decimo de[9] *Re Publica* quasi quendam vitae finem et iudicii terminum. Delectatur[10] quinetiam millenario praesertim in *Phaedro* tanquam denarii corpore, decies enim decem decies mille solidum suum efficit. Delectatur rursus palam in *Phaedro* et hic clam decem millibus, quoniam et[11] ex decem atque

27. Lunae Z 28. planetas *om.* M 29. autem tenet eandem sed . . . eandem quoque Iupiter] *e summo folii praecedentis sui (i.e. f. 180v [14.63–64 supra]) rep. et del.* M 30. dicent YZ 31. in tertio] interio Y

1. XIIII YM 2. Conditione Z 3. illorum Z 4. tertius Z 5. parens Z 6. medici Z 7. deces M 8. facit *om.* YM 9. est Z 10. Delectatus Z 11. et *om.* Z

10,000 is made from the 100 led to itself as to an equal. Here he rejoices secretly in the number 1,000,000 as in the body [or solid] of the 100. This number exists as the hundredth cube in the order of numbers,[9] and can also be called "the cube of the trinity."[10] For, after you have accepted the ten as the line, then the 100 is like the surface made from the ten, and finally the 1000 is like the body produced from the 100. From these three terms you can immediately extract the middle, namely the 100, and take that as the line which you may lead forth to the surface of 10,000, and finally to the solid of a thousand thousand.[11] For thus Plato in the first denomination of the 100 had arrived as far as the surface, when he said "100x100."[12] But in the third [denomination], when he said "the 100 of the cubes," he arrived at the solid made from that surface. In the second denomination, however, that is, of the diagonal numbers, he wandered through innumerable planes.[13]

[iii] However, he mixes evens with odds, both because the discordant concord[14] of qualities moves and generates all things, and also because he is investigating here not only the generation (*genitura*) but also the death of things, and exploring fertility and sterility equally. He mixes planes with solids, both because solids are resolved into planes and planes are brought back into solids, and because, as I was saying above, one can discover all these,[15] each with its particular property, in the celestials and in the elements, by whose[16] powers and motions individual things compounded beneath the Moon are borne along, for better or for worse.

[iv] Not without mystery, and signifying the fatal increment of things, Plato led forth[17] from the 12, which is the first of the increasing numbers. Choosing the entrance and the exit, he drew the perfect exordium out from the first of the perfect numbers, out from the 6 doubled.[18] Then at the end he arrived at the second perfect number, namely at 28, the term of the fatal number.[19]

[v] Finally, over and beyond that great number[20] which is the multiple of the 12 led to and led back to itself—that is, over and beyond 1728, Plato secretly multiplies [i.e., unfolds] this innumerable number.[21] He presents it first as a hundred times a hundred;[22] then as a hundred lateral and diagonal numbers successively arranged and increasing[23]—that is, as a hundred squared numbers derived from squared;[24] and then again as a hundred cubes—that is, solids—that come from cubes that are ever increasing in amplitude.[25] He does this so that not only republics but all ages may be measured by this most

mille resultat, sed inaequalem[12] dignitatem interim utrinque[13] reportans; item fit ex centum in se ducto velut aequale. Gaudet hic clam ipso numero millies mille tanquam corpore centenarii, qui et centesimus cubus existit ex ordine numerorum, et trinitatis cubus dici potest. Postquam enim decem ut lineam accepisti, deinde centum ut superficiem ex eo factam, postremo mille ceu corpus inde productum.[14] Statim ex his tribus terminis medium, scilicet centum, excipere potes tanquam lineam quam[15] producas in superficiem decem millia, postremo in solidum mille millia. Sic enim Plato in prima centenarii denominatione[16] ad superficiem usque pervenerat ubi dixit centies centum; in tertia vero ubi dixit centum cuborum pervenit ad solidum ex illa superficie[17] factum; in secunda vero nominatione,[18] scilicet diametralium, per innumerabilia plana [154v] vagatus.

[iii] Miscet autem aequalia inaequalibus, cum quia ipsa[19] qualitatum concordia discors omnia movet et generat, tum etiam quia non solum genituram hic rerum investigat sed et interitum;[20] fertilitatem pariter sterilitatemque indagat. Miscet et plana solidis, quoniam solida resolvuntur in plana atque haec referuntur ad solida, et quoniam, ut supra dicebam, haec omnia sua quadam proprietate in caelestibus elementisque reperire licet, quorum viribus motibusque singula infra Lunam composita ad melius deteriusve feruntur.

[iv] Nec[21] sine mysterio fatale rerum significans incrementum ex numero 12 crescentium primo produxit, optansque principium exitumque perfectum a numero perfectorum[22] primo deduxit exordium, scilicet ex geminato senario; pervenit insuper ad perfectum postremo secundum, 28, fatalis huius numeri terminum.

[v] Denique ultra magnum illum numerum multiplicatum[23] ex duodenario ducto in se ipsum atque reducto, scilicet 1728, Plato numerum hunc[24] innumerabilem clam multiplicat (scilicet per centum centies; item per numeros centum laterales diametralesque deinceps dispositos atque crescentes, quadratos videlicet ex quadratis; rursus per centum[25] cubos, id est solidos, ex cubis crescentibus semper in amplum) ut amplissimo numero quasi seculo seculorum non res pub-

12. inaequale YM 13. utrumque M 14. productam Z 15. qua Y
16. dominatione YM 17. superfice Y 18. denominatione M 19. ipsum Z
20. in tertium Z 21. Hec M 22. profectorum Z 23. multiplicam Z
24. hinc YZ 25. centrum Z

ample number, by the century of centuries as it were; and so that a term may exist which things compounded cannot surpass,[26] and single things in the meantime, all closed in their own measures,[27] may be distinguished by way of the certain parts of such a great number.[28]

Chapter 16. On the habit, age, and time span of the body for begetting; and on their accommodation.

However, for the sake of happy offspring Plato orders unions to be made from good parents on both sides. Accordingly, I draw attention to the fact that the dispositions (*ingenia*) of each parent should indeed be good; but they should not be in the same condition of good, nor absolutely equal and alike, but rather good for each other, insofar as we adjudge this needful for good progeny, as Plato argues in the *Statesman* and in the *Laws*.[1] All this is in order that fiercer dispositions may be united with gentler ones, and the more vehement may be tempered by the more relaxed, otherwise progeny may emerge which is either exceedingly ferocious or exceedingly cowardly. But both dispositions should be, to their utmost capacity, the most equal in their class,[2] to their utmost capacity the choicest. In the zodiac such signs as are male seem joined successively with feminine signs. Such is the union of the Moon with the Sun, and of Venus with Mars. Such seems to be the union under heaven of the higher wetness with heat, an aethereal heat, and of the lower wetness with cold.[3] The result in the compounded body is the discordant concord such as we find among musicians, when the temper of low-pitched with high-pitched voices is everywhere observed; yet both kinds indeed, although they are uneven, must be accepted in song. Thus too from unlike proportions, namely from the diatesseron and the diapente, is produced the diapason, the most equal of all.[4] Moreover, even habits are generated from odd numbers (as in the case of squared numbers); but odd habits are generated from even numbers.[5]

[ii] The opportune time for public marriages requires evenness [i.e., calmness] in the air and solidity in each body's habit, desire (*affectus*), and age, and in all else. Likewise it requires the power of the Sun, who is solid, and of Venus, who is even, and of Jove, who is vigorously both, and also of the Moon (her aspect according with them).[6] But in his republic Plato requires that all these things must be observed by the magistrates when particular matters are publicly regu-

licae[26] solae sed etiam omnia secula mensurentur, sitque terminus quem composita praeterire non possint, sed interea per certas tanti numeri partes singula suis quaeque mensuris clausa distinguantur.

De habitu corporis, aetate, tempore ad generandum accommodatis. Cap. XVI.[1]

Quod autem Plato iubet felicis geniturae gratia ex utrisque bonis coniugia facienda, sic accipiendum moneo ut bona quidem utriusque parentis sint ingenia, sed non in eadem conditione boni nec aequalia prorsus atque simillima, sed ita invicem bona quatenus ad bonam stirpem necessarium iudicatur. Id autem est, quemadmodum in *Politico Legibus*que disputatur, [1424] ut acriora ingenia mitioribus copulentur, vehementiora remissioribus temperentur, ne alioquin ferocissima vel ignavissima progenies oriatur. Sed pro viribus aequalissima utraque vero ingenia in suo genere esse debent, pro viribus electissima. Talia in zodiaco signa tanquam masculina femininis[2] signis deinceps coniugata videntur. Tale Lunae cum Sole coniugium est, Venerisque cum Marte; tale sub caelo humoris quidem sublimis cum calore quodam aethereo, inferioris autem humoris cum frigore consortium esse videtur. Talis in composito corpore resultat concordia discors, tale apud musicos gravium ubique vocum cum acutis temperies observatur, quae quidem, etsi sunt impares, utraeque[3] tamen accipiendae sunt canore. Sic etiam ex proportionibus dissimilibus, scilicet diatesseron atque diapente, diapason omnium aequalissima procreatur. Sic insuper, velut in quadratis numeris, aequales[4] quidem habitus ex imparibus; inaequales autem ex paribus generantur.

[ii] Tempus autem publicis connubiis opportunum exigit aequalitatem in aere, et in ipso cuiusque habitu corporis et affectu[5] aetateque et in cunctis soliditatem; item potestatem Solis (qui solidus est) et Veneris (quae aequalis) et Iovis (qui valet utroque) Lunae quoque[6] ([quae habet] competentem ad haec aspectum). Observanda vero haec magistratibus Plato mandat in re publica sua ubi publice singula

26. Pca M

1. XV. YM 2. foeminis Z 3. uterque Z 4. aequalis Z 5. affectus Z 6. quo Z

lated and when many brides are joined with their spouses together in public rites.[7]

[iii] In the sixth book of the *Laws* he tempers in union the more vehement passions with the more gentle and [requires that] both passions be moderate and constant in the hour of copulation, so that the child thence conceived—to use his words—may be generated even, stable, and solid—which are mathematical terms.[8] Not only this, but by marriage he joins the more powerful men in the republic with the less powerful, and the rich with the poor, so that from these odds the whole state may emerge even; and—to use his example—that from being exceedingly potent wine it may emerge, after being mixed with water, a tempered drink.[9]

[iv] However, he chooses that a man should enter upon marriage between the ages of 25 and 35. Here he is observing an equilateral, namely 25, which is created from the 5 led to itself (25 is also circular in that starting from the 5 it ends in the 5). Likewise, he is immediately looking forward to and approving 27, the solid procreated from the 3. Finally, when he introduces 35, he is explicitly recognizing both a long number and an oblong.[10] But he is implicitly recognizing 36 also, to which, as to [its] higher term, 35 seems to arrive, 36 being an equilateral (produced from the 6 led to itself), and also a circular (for beginning from the 6 it ends in the 6).[11] Such indeed must be the details you should observe in commentaries, even if they seem trivial, when once you have undertaken to be a mathematician.

[v] Consequently, in the fifth book of the *Republic* he measures the complete span in a man for giving himself over to the begetting of children as being from 30 years to 55, but in women as being from 20 to 40. He supposes that during this span especially men are lively and strong in mind and body alike for the office.[12]

[vi] Why in the *Laws* does he begin the span in a man at the 25th year, but in the *Republic* at the 30th? Because in the *Republic* the most perfect is everywhere desired, and man's rational soul is more perfect and more peaceful in the 30th year. In the *Republic* he attributes 25 years to man as the span of generating, because this number is equilateral and circular. But the age for a woman begins from the unequilateral [20], and the interval of [her] conceiving similarly spans the unequilateral, namely 20 years. For the female is inferior herself and is deemed inferior in the office of generating. The better things, however, are rightly signified in Plato by the better figures and signs.

dispensantur, sponsaeque multae cum sponsis simul in sacris publicis copulantur.

[iii] Sed in sexto *Legum* non modo vehementiores affectiones cum mitioribus coniugio temperat[7] et utrasque in ipsa congressionis hora sobrias atque constantes, ut[8] conceptus inde—ut eius verbis utar—aequalis stabilisque et solidus generetur—quae verba mathematica sunt; verum etiam potentiores in re publica cum minus potentibus et divites cum egenis connubio copulat, ut tota civitas ex imparibus fiat aequalis, atque—ut utar eius exemplo—ex validiore quodam mero simul et aqua potus quidam temperatus evadat.

[iv] Eligit autem virum ad matrimonium ineundum ab annis 25 ad[9] 35, observans videlicet aequilaterum, scilicet 25, ex quinario in se ducto creatum, et circularem, a quinario videlicet in quinarium desinentem; item mox sperans et approbans 27 solidum ex ternario procreatum. Denique ubi inducit 35, longum palam intelligit et oblongum. Subintelligit autem 36 ad quem velut terminum superiorem[10] 35 pervenire videtur tanquam ad aequilaterum ex senario in se ducto productum atque etiam circularem, nam incipiens a senario desinit in senarium. Talia quidem in commentariis observanda sunt, etsi videntur levia, ubi semel mathematicus esse ceperis.

[v] Proinde in quinto de *Re Publica* tempus totum procreandis liberis indulgendum in viro quidem metitur ab annis 30 ad annos 55, in mulieribus autem a viginti ad quadraginta, existimans in hoc praecipue tempore homines ad hoc officium tam animo quam corpore vegetos validosque existere.

[vi] Sed curnam in *Legibus* in viro incipit ab anno 25, in *Re Publica* vero a 30? Quoniam in *Re Publica* perfectissimum ubique desideratur, in anno vero 30 perfectior est et [155r] pacatior animus. Tribuit autem in *Re Publica* viro spatium generandi annos 25, quoniam hic numerus aequilaterus est atque circularis. Mulieris autem aetas ab inaequilatero[11] incipit, similiter et concipiendi spatium per inaequilaterum, scilicet 20, producitur. Femina enim et deterior ipsa est et in officio generandi censetur inferior. Melioribus vero figuris et signis apud Platonem meliora rite significantur.

7. temperant M 8. ut *om.* Z 9. ad annum M 10. superiorem *scripsi* superior YMZ 11. aequilatero Z

Chapter 17. On the perfect number, on divine generation, and on the observation of celestials.

Thus far [I have dealt] with the generating that is called human, but now something must be said about divine generation, whose circuit is contained by the perfect number (as Plato says). The perfect number, I repeat, is either known to God alone, as we said from the onset, or perhaps it is 6 and numbers like it (those which are composed from their parts). But 6 is the prime perfect number for the reasons we gave earlier. Moreover, men add to the praises of the 6 the following: that led to itself it makes the plane circle, namely 36; led back to itself it enacts the solid circle, namely 216. But these numbers are called circular because, beginning from the 6, they end in the 6. Furthermore, they also contain twin circles below themselves, one from the 5, another from the 4. For 5x5=25 and likewise 5x5x5=125; likewise 4x4x4=64. But the circle we should produce from the 4 has been intercepted in the plane; for 4x4 does not end in the same number [i.e., in 4].

[ii] Therefore the circle from the 6, because of its perfection, refers to the circuit of the firmament. But that from the 5 refers to the period of the planets; for this is a fifth region above the elements. But the circle from the 4 refers to the revolution or mutation of the four elements which is in a way interrupted.

[iii] You know, I think, the Platonic order of the planets: Saturn, Jupiter, Mars, Mercury, Venus, Sun, Moon.[1] Therefore, when you arrive at the sixth, you will have arrived for the most part at what is good and life-giving. If you begin from the firmament, you will arrive at Venus; if from Saturn, at the Sun; and if from the Moon, at Jupiter. If you start at the onset itself of conception from Saturn, in the sixth month you will be led to the Sun. If you number the years from birth, beginning from the Moon, you will arrive in the sixth year at Jupiter; and so on similarly. It is not without mystery, therefore, that Moses proposed that the world was perfected on the sixth in the number of the days.

[iv] Remember, moreover, that below 10 the perfect number is 6, below 100 it is 28, and below 1000 it is 496; and below 10,000 there also exists one perfect number, 8128.[2] Here a marvelous vicissitude must be observed: the perfect numbers, beginning from the 6 and then arriving below 100 at the 8, below 1000 revert to the 6, and below 10,000 return again to the 8, and so on similarly.[3] But enough

De numero perfecto et generatione divina et observatione caelestium. Cap. XVII.[1]

Hactenus de genitura quae nominatur humana, nunc vero de divina genesi[2] nonnihil est dicendum. Huius circuitum numerus (ut inquit Plato) perfectus continet, perfectus inquam vel soli Deo notus (ut ab initio diximus) vel forte senarius atque similes qui partibus suis constant. Sed 6 primus est perfectus rationibus quas in superioribus assignavimus. Accedunt haec insuper ad senarii laudes, quod in se ductus circulum facit planum, scilicet triginta sex, in se reductus circulum agit solidum, scilicet 216. Dicuntur vero circulares, quoniam incipientes a senario desinunt in senarium. Continent[3] insuper infra se circulos quoque geminos, alterum quidem ex quinario, sed ex quaternario alterum. Nam quinquies quinque = 25,[4] item quinquies quinque quinquies = 125, item quater quatuor quater = 64. Sed circulus qui producendus est ex 4 interceptus est in plano; nam quater 4 non desinit in eundem.

[ii] Circulus igitur ex ipso 6 propter perfectionem refert[5] firmamenti circuitum; qui autem ex 5, periodum planetarum—est enim haec super elementa quinta quaedam regio; sed qui ex 4, revolutionem vel commutationem 4 elementorum quodammodo interruptam.

[iii] Scis ut arbitror Platonicum ordinem planetarum: Saturnus, Iupiter, Mars, Mercurius, Venus, Sol, Luna. Perveniens igitur in senarium, plurimum in bonum vivificumque perveneris: si a firmamento inceperis in Venerem, si a Saturno in Solem, si a Luna in Iovem. Si ab ipso conceptionis exordio exorsus fueris a Saturno, sexto mense perduceris ad Solem. Si a nativitate annos numeres incipiens a Luna, anno sexto consequeris Iovem, similiterque[6] deinceps, ut non absque mysterio Moses senario dierum numero mundum velit fuisse perfectum.

[iv] Memento praeterea perfectum numerum infra 10 quidem sex existere, infra centum vero 28, sed infra mille 496, at vero intra decem millia unum quoque perfectum existere, 8128. Ubi vicissitudo mirabilis observanda per quam perfecti numeri a senario incipientes, et mox infra centum pervenientes ad 8, iterum intra mille ad sena[1425]rium revertantur,[7] rursusque[8] intra decem millia ad 8 re-

1. XXVI Y X6 M 2. generatione Z 3. Continet YM 4. quinquies quinque = 25, item *om.* M 5. infert M 6. Simulteque [?] Y 7. revertuntur MZ 8. -que *om.* Z

of this. What I am now going to say about the 6 suppose said of the rest of the subsequently perfect numbers.

[v] We arrive at the 6 either through its parts or through the whole. Its parts are 1, 2, 3. We approach it through the 1 when we say once 6 or 6x1, through the 2 when we say twice 6, and through the 3 when we say thrice 6; we approach it through the whole when we reckon 6x6 or 6x6x6.[4] Therefore it seems meet that we look to almost all the numbers of this kind, exactly as we do to the 6 itself, when Plato says that the perfect number contains the circuit of divine generation. This is similarly true of 28 and 496, and likewise of 8128 and the rest of the numbers that are perfect for a similar reason. These are indeed most rare. For just as there is only one such number under 10, so there is in turn only one under 100, and one under 1000, and then just one under any 10,000. As rare as is the perfection, so rare is the divine progeny that comes forth.

[vi] Let us return to the 6. How should we observe either the 6 itself or such multiplications of it? Let me briefly reply [that we should observe it] in the years of the century, or in the centuries of years, and in the life span (*aetate*) of man; and hence in the time that is opportune for marriage and conception, for the onset of education and instruction, and for trying to capture auspicious [moments] to embark on projects and the like.[5] It is difficult enough to explore these matters with regard to the 6, but quite impossible with regard to the other perfect numbers more ample than the 6, especially those beyond 28, the number second in perfection.

[vii] Allegorically the 6 (and each perfect number) seems to pertain to the divine class. Nothing is wanting or overflowing to this divine class—as is the case similarly with the 6 and numbers like it arranged by way of their members [i.e., parts]. This divine class neither lacks nor exceeds anything, nor does anything flow away out of it or flow into it, nor does it need outside assistance; but it is equal and tempered, and it depends on, and stands firm in, its parts and powers.

[viii] Therefore, having lighted on the occasion, I am disposed to debate for a little while with the astrologers. The perfect number [6] seems to signify constancy, equality, temperance, and therefore a particular complexion for man—tempered, sufficient to itself, and constant (which is most rare indeed, like that number). Likewise it seems to signify Jupiter, who, among the celestials, possesses this complexion to the greatest degree;[6] or again to signify the whole harmony of the celestials when he/it accords with us thus.[7] Therefore we must choose

meant;[9] similiterque deinceps. Sed de hoc satis. Quae vero nunc de senario dicam, de ceteris subinde perfectis dictum existimato.[10]

[v] Pervenitur autem ad 6 vel per partes suas vel per totum. Partes eius sunt, id est,[11] 1, 2, 3. Per unum acceditur quando dicimus semel 6 vel sexies unum; per duo quando bis 6; per tria vero quando ter 6; per totum autem quando computamus sexies 6, vel sexies 6 sexies.[12] Omnes igitur eiusmodi numeri ferme perinde atque senarius ipse observandi videntur, ubi dicitur a Platone perfectus numerus ipsum divinae geniturae circuitum continet; similiter quoque circa[13] 28, atque circa 496, item circa 8128,[14] atque ceteros simili ratione perfectos qui profecto rarissimi sunt. Sicut enim unicus infra decem, sic unicus deinceps infra centum, unus infra mille, deinde unicus intra quodlibet decem millia. Tam rara perfectio est, tam rara[15] progenies divina prodit.

[vi] Sed ad senarium revertamur. Quonam pacto vel ipsum 6 vel huiusmodi multiplicationes eius observare debemus? Ut breviter respondeam in annis seculi vel in seculis annorum, in aetate hominis atque hinc in opportunitate connubii conceptionisque, in educationis et eruditionis exordio, in captandis operum auspiciis atque similibus. Difficile quidem est haec circa senarium explorare, impossibile vero circa perfectos alios senario ampliores, praesertim ultra 28 perfectione secundum.

[vii] Allegorice vero senarius et quisque perfectus ad divinum genus pertinere videtur cui sicut senario similique per sua membra digesto neque deest neque superest, nec deficit nec excedit quicquam, nec effluit nec influit aliquid, nec alienis indiget adminiculis,[16] sed aequale temperatumque[17] est, et suis partibus viribusque nititur atque consistit.

[viii] Hinc igitur occasionem nactus[18] parumper cum astrologis confabulari libet.[19] Perfectus numerus constantiam, aequalitatem, temperantiam significare videtur, ideoque complexionem quandam hominis temperatam sibique sufficientem atque firmam, quae quidem sicut ille numerus rarissima[20] est; item Iovem inter caelestia maxime talem; rursus totam caelestium harmoniam quando nobiscum ita consonat.

9. remeat M 10. existimatio Z 11. id est, *om.* M 12. sexties YZ
13. circa *om.* Z 14. 8129 Z 15. perfectio est tam rara *om.* Z
16. adminiculus Y 17. -que *om.* Z 18. nactis YM 19. licet Z
20. carissima Z

this complexion because of its suitability for marriage and conceiving. But Jupiter in general is designated through the 6, both because of the reasons we have just talked about, and also because for us he is sixth among the celestials. Nor must we neglect those conjunctions of Jupiter with Saturn[8] in which Jupiter, who is happily disposed [towards us], by a certain closeness or familiarity conciliates Saturn, who is otherwise discordant to us. But they say that the influence of that league flourishes for twenty years, until they are joined together for a second time elsewhere.[9] Perhaps Saturn acts in the first year after the conjunction, Jupiter in the second, Saturn in the third, Jupiter again in the fourth, and so on in succession. That conjunction must therefore be chosen for the advantages it offers us. Also we must choose that year in which Jupiter is active and especially the sixth year, the twelfth, and the eighteenth (for these two accord with the sixth). Meanwhile we should choose the sextile aspect of Jupiter to Saturn, or the trine aspect, which is composed from the double sextile.[10] For these particular [aspects] have or represent the benign nature (*affectio*)[11] of the sixth and perfect number. Furthermore, the Moon, when she mixes her quality rightly with the quality of the Sun, performs the six-like temperance, equality, and constancy of Jupiter:[12] first, if she is in the center of the Sun, which is briefest indeed;[13] and second, if she is in the sextile or trine aspect to the Sun, for thus she makes [her] quality most jovian and like the 6. And because the 12 is the first of the increasing numbers, remember that for propagating offspring most happily the Moon should be chosen when she is increasing in light.[14] Perhaps too in acting the Moon alternates daily with the Sun in the same manner as Jupiter does with Saturn over the years: thus the Moon possesses the second day after her union with the Sun—for the Sun possesses the first day after the union—and so on until they come into union again. Therefore it seems we should choose the Moon on each day following, when she is tempering the Sun for us. We should also observe Jupiter when he is ascending or otherwise potent; and observe Venus as a lesser Jupiter;[15] and observe likewise the day or hour of Jupiter or of Venus.

[ix] We should inquire into all these things and reflect upon (*comparanda*) them to our utmost ability, so that, having acquired temperance and stable prosperity in our spirits and bodies, we may then acquire the power suitable for contemplations from Saturn (the patron of understanding) by way of Mercury (in this office the servant of Saturn).[16] In this way the Saturnian ages may return to us some day,

Haec igitur ad connubii conceptionisque opportunitatem sunt optanda. Omnino vero Iupiter per senarium designatur, tum[21] propter ea[22] quae modo diximus, tum etiam quia[23] nobis est inter caelestia sextus.[24] Neque praetermittendae sunt Iovis cum Saturno coniunctiones illae in quibus feliciter affectus Iupiter Saturnum alioquin nobis dissonum quadam [155v] familiaritate conciliat. Tradunt vero foederis illius influxum annos viginti vigere donec iterum alibi coniungantur.[25] Forte et[26] anno dehinc primo Saturnus agit, secundo Iupiter, tertio Saturnus, iterum quarto Iupiter, vicissimque deinceps. Eligenda[27] igitur est ad opportunitates nostras illa coniunctio; necnon annus ille in quo Iupiter operatur, praesertim sextus annus et duodecimus decimusque octavus (nam hi duo cum sexto conveniunt). Optandus est interea sextilis aspectus Iovis[28] ad Saturnum aut trinus ex[29] gemino sextili compositus. Haec enim singula senarii perfectique numeri affectionem habent vel repraesentant. Praeterea Luna qualitatem suam cum Solis qualitate recte commiscens senariam Iovis temperantiam et aequalitatem[30] agit atque firmitatem:[31] primo si in[32] centro Solis sit[33]—quod quidem est brevissimum; secundo si in aspectu ad Solem sextili vel trino, sic enim maxime Ioviam conficit qualitatem senario similem. Et quia duodenarius primus est crescentium, memento Lunam lumine crescentem eligendam[34] esse ad prolem felicius propagandam. Forte etiam Luna cum Sole eam in dies agendi vicissitudinem agit quam Iupiter cum Saturno per annos. Itaque Luna a coitu Solis secundum obtinet diem, primus[35] enim inde Sol tenet atque ita deinceps donec rursus congrediantur. Luna igitur sequenti quoque die Solem nobis temperans eligenda videtur. Observandus quoque Iupiter ascendens aliterve[36] potens, aut Venus quasi minor Iupiter; item dies vel hora Iovis aut Veneris.

[ix] Haec investiganda sunt omnia et pro viribus comparanda, ut, temperantiam firmamque prosperitatem adepti spiritibus et corporibus,[37] inde vim contemplationibus[38] aptam a Saturno intelligentiae fautore[39] per Mercurium ad hoc Saturni ministrum adipiscamur, ut

21. cum M 22. propterea M 23. qui M 24. sexus M 25. coniugantur YZ 26. etiam M 27. Eligendo Z 28. ad Iovem Z 29. et Y 30. qualitatem Z 31. infirmitatem Z 32. in *om.* MZ 33. fit M 34. religendam Z 35. primas Z 36. Alive Z 37. et corporibus *om.* Y 38. contemplationis Z 39. favere Z

and our dispositions (*ingenia*)—as Plato fervently wishes here—may be transformed from iron into silver and gold.[17]

[x] Finally, Plato seems as it were to have prophesied that in those ages and times which arrive at, or return to, the perfect number, certain divine men will arise; and to them the ends of those ages will be known.[18] Perchance the following lines refer to this:

> Now comes the last age of the Cumaean song.
> The great order is born from the whole of the generations . . .
> Now the new progeny is dispatched from heaven on high.[19]

But these matters issue indeed from that dispenser who has arranged all things in number, weight, and measure.[20] But we have debated enough in the company of Plato and the Muses as they play with a serious and inextricable matter.[21] The end.

quandoque secula[40] nobis Saturnia revertantur atque (ut Plato hic vehementer optat) ingenia ex ferreis in argentea et aurea transformentur.

[x] Plato denique quasi[41] vaticinatus videtur[42] in his seculis et temporibus, quae ad numerum perfectum veniunt vel referunt, divinos quosdam homines exoriri in quos fines seculorum pervenerunt.[43] Huc tendit forsitan illud:

Ultima Cumaei iam venit carminis aetas.
Magnus ab integro seclorum nascitur ordo
Iam nova progenies caelo dimittitur alto.

Sed haec illo quidem[44] dispensatore proveniunt[45] qui omnia numero et pondere mensuraque disponit. Nos autem una cum Platone Musisque in re·seria inextricabilique ludentibus satis confabulati sumus. Finis.[46]

40. specula Z 41. quas M 42. videatur Z 43. provenerunt M
44. quidem *om.* Y 45. provoniunt Y 46. Scripsi Ego Hartmannus Schedel artium & utriusque medicine doctor Anno domini MCCCCCI In Nuremberga. Laus Deo. *add. colore rubro* M

Notes to Text 3

Chapter 1

1. The Greek *kuklos* is singular. In transliterating it Ficino uses it as an accusative plural.

2. The *peritropê* is the perfect circular motion of the substance, of the *kuklos*, of a heavenly sphere, and therefore of all the fixed stars in the eighth sphere of the firmament.

3. The *periphora* is the irregular course of a planet as contrasted with the regular *peritropê* of a sphere.

4. As irregularly regular, the planetary revolutions serve as the medium by which, in their perfect regularity, the spherical conversions selectively work upon the imperfect and irregular course of things earthly by way of their individual properties and the state of their preparation. Note Ficino's insistence on what elsewhere he refers to Neoplatonically as the "series" or "chains" of accord that bind the universe; see, for instance, his *De Vita* 3.14.

5. Thus things earthly at "the center" are governed by spherical as well as earthly measures, by conversions as well as revolutions, though we do not know which particular stellar conversions or how many of them are involved in measuring the life cycle of any one species or individual. For a list of the major stars known to Ficino, see his *De Vita* 3.8.1–41 (ed. Kaske and Clark), where it is attributed to Hermes Trismegistus.

6. Thus "fate" means the combined measures of stellar conversions and planetary revolutions. All sublunar life is the result of its interaction with natural properties in the species and in the individual, provided they are "prepared" or in "accord." The complexity of fate's relationship with nature is thus unfathomable except to God or to someone inspired by Him.

7. *Ingenium* is an important concept in this treatise; see Part One, Chapter 3, pp. 88–89, 100 above. It is to be identified with our intellectual capacities insofar as they are governed by, are in accord with, our temperament and disposition. It is not clear whether for Ficino such a corporate entity as a family, a state, or a nation can also have an *ingenium;* and if so, what its relationship would be to the notion of a presiding genius or daemon. The ramifications are legion. Contrast *De Vita* 3.23.10–20 and passim (including the chapter heading) with 3.24.18–21 (ed. Kaske and Clark).

8. Ficino returns to the role of the perfect number(s) in his last chapter and to the notion that God has destined certain divine or daemonic intellects to have knowledge of, and to preside over, the terms of the durations measured by such a number or such numbers. For their definition, cf. Theon, *Expositio* 1.32 (ed. Hiller, pp. 45.9–46.3). Plutarch's famous essay *De Defectu Oraculorum* argues that great daemons also preside over measurable, if multigenerational, durations.

Chapter 2

1. The "numberless" Ficino identifies as a Platonic term for myriads, that is, numbers between 10,000 and a million. What he has in mind here is probably 36,000 (i.e., 6^2x1000), for this is the value he accepts for the great year in his epitome for the *Republic* 10, and in his ***argumentum*** for the *Laws* 6 (*Opera*, pp. 1431, 1505); see too his *Timaeus* Commentary, summa 20 (*Opera*, p. 1468.2).

2. The parts are the factors of the perfect number and they measure the span of a "form," presumably in the Aristotelian sense of what is united with matter to make an entity. Ficino has in mind the appointed span of an individual person's life or that of an entity like a state, a span that has been allowed to run its full and perfect course. In chapter 3 below, however, he will declare that 12 is the number that governs "the universal world form, the human form, and the form of the state."

3. Cf. Ficino's *Platonic Theology* 17.2 (ed. Marcel, 3:155) and *De Vita* 2.20.1–21 (ed. Kaske and Clark). He was familiar with the idea from a number of ancient sources, e.g., Theon, *Expositio* 2.46 (ed. Hiller, p. 104.1–12), and Proclus, *In Alcibiadem* 196 (ed. Westerink, pp. 90–91).

4. Ficino is now going to mention in passing the particular roles played in measuring durations by 6, 8, and 12 and then by various kinds of numbers (unequilateral, equilateral, solid, diagonal).

5. See chapter 4 below. For the notion of deficiency, i.e., that the sum of a number's factors (or divisors or aliquot parts) is less than itself, cf. Theon, *Expositio* 1.32 (ed. Hiller, p. 46.9–14). Eight is solid, however, in that it is the cube of 2. As such it is the first of the solid numbers.

6. Again see chapter 4 below. An abundant number is greater than the sum of its factors; cf. Theon, *Expositio* 1.32 (ed. Hiller, p. 46.4–8). Twelve is the first of such numbers.

7. The unequilateral "long" numbers are the sums in the regular series of even numbers, beginning with 2: 2+4=6, 2+4+6=12, 2+4+6+8=20, 2+4+6+8+10=30, and so on; and as sums they are always even and therefore female (cf. chapter 6 below). As multiples, however, the "longs" are the products of adjacent and therefore odd and even numbers—2x3, 3x4, 4x5, 5x6, and so on—while unequilateral "oblong" numbers are the products of numbers differing by more than 1. The latter are of little or no interest to Ficino here or to the arithmological tradition in general. Cf. Theon, *Expositio* 1.13 (on unequilaterals), 17 (on oblongs) (ed. Hiller, pp. 26.21–27.22, 30.8–31.8).

8. Equilateral numbers are the sums in the regular series of odd numbers, beginning with 1: 1+3=4, 1+3+5=9, 1+3+5+7=16, 1+3+5+7+9=25, and so on; and they alternate between being even and being odd. As products, however, they are also the squares of the regular series of odd and even numbers. Cf. Theon, *Expositio* 1.15 (on equilaterals), 20 (on their alternation) (ed. Hiller, pp. 28.3–15, 34.1–6).

9. A solid number is the product of three numbers and can be of four kinds: a cube, altar, plinth, or beam. Cf. Theon, *Expositio* 1.7 (the definition), 29 (the four kinds) (ed. Hiller, pp. 24.25–25.3, 41.8–42.2). But Ficino is exclusively interested here in cubes.

10. That is, in the commentary on (or epitome for) the section in the *Republic* 9 at 587C–588A on the number 729. Ficino's epitome for this ninth book was written, however, prior to 1484, and merely states, "Inter haec casu quodam nescio quid interserit mathematicum, cuius declarationem ex commentariis in *Timaeum* accipies opportunius" (*Opera*, p. 1427). His remark here refers therefore to comments he will make towards the end of chapter 3 below.

11. Ficino is referring to the powers of rational diagonals in the series of squares he will outline in chapter 5 below.

Note that throughout I have rendered ***diameter*** as a "diagonal" since Ficino is dealing with a square's diagonal, and not with a diameter (*diametros* in Greek can mean both); obviously such a diagonal is the same as the hypotenuse of the isosceles right-angled triangle that constitutes one half of the said square. A ***numerus diametralis*** correspondingly is a "diagonal number" (often thought of in terms of its power, that is, as squared).

Chapter 3

1. Namely, at *Republic* 8.546B. In Ficino's view, as his subsequent comments testify, this passage is referring to the *Timaeus*'s lambda with its base of 8–12–18–27; cf. Theon, *Expositio* 2.38 (ed. Hiller, pp. 94.11–96.8).

2. *Timaeus* 35B-36B, 43D. Plato had argued at 31B ff. and 36A ff. that to define the numerical relationship we always need between solid numbers two means, but between square numbers just one mean. Ficino had already dealt with the problem in his *Timaeus* Commentary 19 and 23 (*Opera*, pp. 1446.1, 1448.1).

3. See Part One, Chapter 2, nn. 7, 8 above. Cf. Theon, *Expositio* 1.16 (ed. Hiller, pp. 28.16–30.7) on the fact that equilaterals embrace unequilaterals as proportional means but not the reverse. Twelve is a plane insofar as it is the product of 3x4; it is an unequilateral as a member of the unequilateral series; and it is a mean between 16 and 9 in that 16:12 and 12:9 are both in the ratio of 4:3.

4. The logic of the argument requires that the means between the solids 8 and 27 cannot be the two equilateral planes referred to here—namely 9 and 16—but rather 12 and 18 as already stated (though 18 is not part of the unequilateral series). I have emended the text accordingly by omitting ***plana***.

5. That is, the interval of the fifth; cf. Theon, *Expositio* 2.13, 37 (ed. Hiller, pp. 62.1–63.24, 93.17–25).

6. That is, the interval of the fourth; cf. Theon, ibid.

7. That is, the full octave that includes the fifth and the fourth; cf. Plato, *Timaeus* 36AB and Theon, ibid.

8. Ficino uses the term *compositio* to mean addition. Thus 5—the "root" of the ratio 3:2—when "compounded" with 7—the "root" of the ratio 4:3—makes 12.

9. *Commixtio* means multiplication; and the "parts" are the parts of the "root." In these two cases the parts are 4, 3, and 2; and 4x3, 2(3x2), and 3(2x2) all equal 12, as Ficino goes on to explain.

10. The refusal to accept 1 or 2 as numbers in the strict sense was traditional; cf. Theon, *Expositio* 2.42 (ed. Hiller, p. 100.13–17). Hence 3 became the first number as the first determined "multitude" and 4 the first square, since it contains the first even and the first odd number; cf. Ficino's *Timaeus* Commentary 20 (*Opera*, p. 1446.2). At 2.44 (ed. Hiller, p. 102.3) Theon had declared that 1 is not a number, and at 2.41–42 (ed. Hiller, p. 100.9–17) he had implied that 2 is not a "determined" number.

11. *Phaedo* 110B–111C. Cf. Ficino's epitome (*argumentum*) in his *Platonis Opera Omnia* (1491), fol. 175v (sig. y3v) (i.e., *Opera*, p. 1394): "Quod autem terrae sublimis faciem in duodecim dividit plagas inde provenit quia duodecim congruit zodiaci signis, duodecim spherarum regitur animabus, et duodecima est mundi sphera, atque veluti totius fundamentum dodecaedram illam sibi usurpat [*Op.* usurpati] figuram quam *Timaeus* attribuit mundo."

12. *Critias* 109B ff., 113BC—the gods had the earth apportioned among them? There is no mention of 12 here, and although there are twelve Olympians, Critias explicitly says that Athena and Hephaestus, since they shared a love of wisdom and artistry, shared one allotment, namely Attica! Ficino's *Critias* epitome in his *Opera*, pp. 1485–1488, nowhere refers to the twelve regions, though it does refer to the flood; and he probably interpreted the allusion in the light of the *Phaedo* 110B ff. to which he has just referred.

Interestingly, the *Critias* epitome refers to "Origenes" using the *Republic* 8 [i.e., at 546A4 ff.] to point out that "certain celestial circuits are the causes of fertility and sterility both of bodies and of souls" (p. 1487). Ficino's acknowledged source is Proclus's *In Timaeum* 1:162.29–30 (ed. Diehl; trans. Festugière, 1:216). This should alert us to the importance for Ficino of adjacent sections of Proclus's commentary, sections glossing the two lemmata at *Timaeus* 24C5–6 ("*Eklexamenê ton topon*" and "*eukrasian tôn hôrôn*") and devoted to the themes of Athena's "allotment" or "choosing" of Attica and of what makes a certain place propitious.

13. *Laws* 5.745B–E, 746D, 6.771BC. Cf. Ficino's epitomes in his *Opera*, pp. 1502, 1504–1505, 1522 (to the opening of book 12). For 12 as the symbol of "perfect procession," see Proclus's *Platonic Theology* 6.18, 19 (ed. Portus, pp. 394–400).

14. *Phaedrus* 246E–247E. Cf. Ficino's *Phaedrus* Commentary 11 (ed. Allen, pp. 124–127).

15. *Timaeus* 55C4–6—an allusion to the dodecahedron. See also the *Epinomis* 981BC and cf. Ficino's *Timaeus* Commentary 44 [misnumbered 41] (*Opera*, p. 1464.1 verso). I quote from the latter as it appears in the *Platonis Opera Omnia* of 1491, fol. 251r–v (sig. H3r–v): "Denique dodecaedram figuram mundo, ut dicebam, accommodavit, quoniam siderum formae duodecim suspiciuntur in zodiaco quorum quaelibet in partes triginta secatur. Similiter in figura dodecaedra intueri licet pentagonos duodecim singillatim in triangulos aequilateros quinque divisos ita ut unusquisque rursum ex triangulis sex [*Op. om.*] scalenis conficiatur et in omni mole dodecaedra trecentisexaginta reperiantur trianguli quot [*Op.* quod] etiam zodiaco portiones existunt." Cf. Plutarch, *Platonicae Quaestiones* 5.1 (*Moralia* 1003CD).

We might note that the extant portions of Calcidius's *In Timaeum* only go up as far as 53C and those of Proclus's *In Timaeum* only as far as 44D2 (and

in the MS which Ficino used, the Riccardiana's gr. 24, only as far as 35B2). Neither commentary therefore was directly relevant. Incidentally, Proclus's *In Timaeum*—an important resource for Ficino—contains in its entirety just seven inconsequential allusions to the *Republic* 8.546A1–D3 (and in the Riccardiana's partial MS just three!); see the *index testimoniorum* in Boter's *Textual Tradition*, pp. 345–346.

Moreover, Ficino cannot have read the thirteenth treatise of Proclus's *In Rempublicam* 13 (ed. Kroll, 2:45.6–46.18; trans. Festugière, 3:152–153), which deals with the dodecahedron, since he worked from a MS which only contained the first twelve treatises (see Part One, Chapter 1, n. 88 above).

16. *Platonic Theology* 4.1 (ed. Marcel 1:153–155). See respectively nn. 13 and 15 above for the references to Ficino's *Laws* epitomes and his *Timaeus* Commentary (though he treats no further of the 12 there and he may be thinking rather of passages in his epitome for book 10 of the *Republic* [*Opera*, pp. 1431, 1433]).

17. That is, the forms of the world body, of the human body, and of the body politic; cf. chapter 2, n. 2, above. The reference here to the human body is to the zodiacal man, i.e., to the traditional theory that goes back to Ptolemy and beyond that the body can be divided into twelve parts presided over by the signs of the zodiac. See my "Homo ad zodiacum."

18. See chapter 4, par. iv below.

19. For circular numbers, cf. Theon, *Expositio* 1.24 (ed. Hiller, pp. 38.16–39.9), and Ficino's *Timaeus* Commentary 17 (*Opera*, pp. 1444.4–1445).

20. For the Sun, Venus, Jupiter, and the Moon as the "fountains" of life, see chapters 12 par. iv, 14 par. iii, 16 par. ii, and 17 par. iii below. Cf. Plato, *Cratylus* 396AB: "For there is none who is more the author of life for us and for all than Zeus the lord and king of all. Wherefore we are right in calling him Zena and Dia, which are one name, although divided, meaning the god through whom all creatures always have life (*di' hon zên aei pasi tois zôsin huparchei* B1–2)." This was a passage to which Ficino often referred, e.g., in his *Philebus* Commentary 1.26 (ed. Allen, pp. 246–247).

21. That is, from a Ptolemaic perspective, their orbits around the earth. Cicero, for instance, in his *De Natura Deorum* 2.20.52–53, gives the received orbital times of the planets as follows (the actual sidereal periods follow in parentheses): Saturn about 30 years (29 years 168 days), Jupiter 12 years (11 years 314.1 days), Mars 2 years minus 6 days (1 year 321.9 days), Venus 1 year (224.7 days), and Mercury about 1 year (87.97 days). Cf. Theon, *Expositio* 3.12.

22. This is difficult. I take it that *motu medio* means "in her motion across or to the middle of heaven" or "midway through her motion." The Moon traverses 28 mansions in all (28 being the second perfect number), and each mansion consists of 12 degrees (actually of 12.857142 degrees). She traverses one a day. The mansions are positioned among both the 12 zodiacal signs and the 12 arcs of the divided ecliptic, the 12 *plagae* or mundane houses, though these are not coterminous. Since each sign and each *plaga* are divided into 30 degrees, she variously traverses each in two and a third days.

We might note that in the *De Vita* 3.4.68–69 (ed. Kaske and Clark) Ficino had referred to the theory that the Moon is in conjunction with, in opposition to, or in an aspect with, other planets if it is within 12 degrees on either side of the various requisite positions, a margin of error called the "orb."

23. An open reference. Twelve is significant in the Scriptures as the number of the tribes of Israel and of Christ's disciples, and in the Book of Revelation as the number of the gates of the New Jerusalem (21:12–14), the number of stars in the crown of the woman clothed with the sun (12:1), the manner of fruits born by the tree of life (22:2), and the number of the "sealed"—in that 144,000 is the total number of the twelve tribes, each of 12,000 (7:4 ff.).

24. Cf. Ficino's *Phaedrus* Commentary, summa 25 (ed. Allen, p. 169); also the *Theologumena* 80 (ed. de Falco), and Theon, *Expositio* 2.37, 39, 49 (ed. Hiller, pp. 93.17–25, 99.17–23, 106.7–10)—on the decad as the sum of the tetraktys and the number to which all others are "brought back."

25. At 587C–E ff. Ficino's epitome (*Opera*, pp. 1426–1427) contains nothing of relevance.

26. That is, 12 contains the product of 2x5. It is that product added to its two-tenths (i.e., its fifth).

27. That is, diapente and diatesseron, the "consonances" of the fifth and the fourth respectively; see nn. 5 and 6 above.

28. The readings in both Y and Z are clearly wrong, and the passage is missing in M.

29. The average length of a lunar sidereal circuit is 27 days, 7 hours, and 43 mins., while that of a lunar synodic period (the interval between one new moon and the next) is 29 days, 12 hours, and 44 mins. Ficino is approximating the difference between the two periods.

30. This is presumably again a reference to 587E ff., which adduces 729 as a "true number . . . pertinent to the lives of men if days and nights and months and years pertain to them" (588A).

31. Cf. n. 22 above.

32. The seven planets bestow two "perfections" upon us, the six superior planets, the first perfection, and the Moon in her twenty-eight mansions, the second, 6 and 28 being the first two perfect numbers.

33. That is, Plato is going to present us with two fatal numbers that are cubes: with 729 as the cube of 9, and with 1728 as the cube of 12. Cubing is taken to be the "highest" power, because geometrically it creates three-dimensionality. Sublunar nature is governed by cyclical movement, and this is symbolized by the raising of a number to its third power and the reduction of that power to its cube root.

Chapter 4

1. At 546B5: "*auxêseis dunamenai te kai dunasteuomenai.*"
2. That is, 1:2 reverses 2:1, 1:3 reverses 3:1, and so on.
3. Cf. Theon, *Expositio* 2:31 (ed. Hiller, p. 82.12–21).

4. *partientes vero minuunt quasi continuum* is difficult. *Continuum* might mean more literally the smaller number "joined to" a larger and dividing it. But the point is that the proportions—that is, quotients—increasingly diminish, because, even though the dividends increase, the divisors increase too.

5. Cf. Theon, *Expositio* 1.32 (ed. Hiller, p. 45.19–22).

6. Cf. Theon, *Expositio* 1.32 (ed. Hiller, p. 46.9–12).

7. Cf. Theon, *Expositio* 1.32 (ed. Hiller, p. 46.4–8).

8. The equilaterals 9 and 16 are the result of the addition series of odds, 1+3+5+7, etc., which produces a succession of sums which as products are squares. Since 16 is also the sum of 12's aliquot parts, it means that 12, itself an unequilateral, shares in 16, an equilateral.

9. For 6 as the first spousal number—that is, the first product of a union between a male (odd) and a female (even) number—cf. Theon, *Expositio* 2.45 (ed. Hiller, p. 102.4–6); also the *Theologumena* 43, and Iamblichus, *In Nicomachi Arith. Introd.* (ed. Pistelli, p. 34.19 ff.).

10. That is, for numbers to be spousal they must be adjacent; 3x6 or 9x2 are not spousals and 18 is not therefore a spousal number. From the perspective of addition, spousals are the "long" unequilaterals. Cf. the *Theologumena* 43.

11. At 546B6–7: "making similar" ("*homoiountôn*"), "making dissimilar" ("*anomoiountôn*"). Cf. Theon, *Expositio* 1.22 (ed. Hiller, pp. 36.12–37.6).

12. Twenty-four is an "oblong" unequilateral, being the product of 6x4. Cf. Theon, *Expositio* 1.22 (ed. Hiller, p. 36.15–20), who takes 6 as 3x2 and 24 as 6x4 and establishes their proportionality by way of the formula 6:3 = 4:2.

Chapter 5

1. Cf. Theon, *Expositio* 1.3, 4, 7, 19, 23, 31 (ed. Hiller, pp. 18.6, 19.21, 24.23, 33.5–7, 37.17–19, 43.4–8, 10–11).

2. Note that Ficino is not thinking in terms of an isosceles right triangle.

3. Cf. Theon, *Expositio* 1.31 (ed. Hiller, pp. 42.10–45.8).

4. Again cf. Theon, *Expositio* 1.31 (ed. Hiller, p. 44.3–8).

5. Again cf. Theon, *Expositio* 1.31 (ed. Hiller, p. 44.9–12).

6. *Compensatio* in the sense of *adaequatio*—the reestablishment of equality or balance.

7. Again cf. Theon, *Expositio* 1.31 (ed. Hiller, pp. 44.12–45.8).

8. By "incommensurables" and "commensurables" Ficino means here the diagonals and the sides. The commensurable sides together need the 1 as "equalizer" in the sense that 1 has to be added to, or subtracted from, the sum of their squares in order for that sum to equal the square of their "rational" diagonal—as in $5^2+5^2-1=49$ (where $49=7^2$)—though the actual diagonal is $\sqrt{50}$ and therefore irrational in the sense of "incommensurable." Put another way, 1 must be added to or subtracted from the square of the "rational" diagonal in order for it to equal the sum of the squares of the two commensurable sides—as in $7^2+1=50$ (where $50=5^2+5^2$). The one diagonal "singly"

needs the equalizing 1, whereas the two sides need it "together." Ficino thus tries to account for the famous crux at 546C5.

9. A reference to his treatment of *commensuratio* (i.e., of rational numbers) in chapter 10, par. iv below.

10. That is, the proportion of *sesquialter*, of 1½ to 1—in music the harmony or "consonance" of the fifth called diapente.

11. At 546C5: "*pempados.*"

12. At 546C6: "*triados.*"

13. He may be referring here specifically to the perfect cube of the 9 tripled, namely to 729, the number introduced in the ninth book of the *Republic* at 587E; or more generally to any solid constituted entirely or even partially from 9 or from any of its multiples.

Chapter 6

1. Cf. Theon, *Expositio* 1.7 (ed. Hiller, pp. 24.16–25.4).

2. Obviously we can have equilateral planes such as 2x2 and unequilateral planes that are long such as 2x3 or oblong such as 2x6. Ficino cannot ignore the oblongs given the *oblongiori/e* of Plato's text.

3. Of course, certain numbers are both long and oblong: 12 for instance is long as 3x4 but oblong as 6x2, as Theon observes in his *Expositio* 1.17 (ed. Hiller, p. 30.18–23).

4. Again as Theon observes in his *Expositio* 1.17 (ed. Hiller, pp. 30.23–31.2), some numbers are only oblongs; 40, for instance, is triply so as 20x2, as 10x4, and as 8x5.

5. That is, multiplication is seen metaphorically as a begetting between two numbers that "commix"; if such numbers are adjacent (i.e., long), they are "spousals." Cf. chapters 3, n. 9 (on *commixtio*), and 4, n. 10 (on spousals) above.

6. Ficino begins with a consideration of the two number series created by the addition of odd numbers and then by that of even, postponing until the next chapter his consideration of a third, the so-called trigon, series, which is created by the addition of odd and even numbers together. He does so because he needs to establish definitions first for equilateral and then for unequilateral numbers. Theon had adopted the same order in his *Expositio* 1.13–19 (ed. Hiller, pp. 26.21–33.18).

7. Cf. Theon, *Expositio* 1.15 (ed. Hiller, p. 28.3–15).

8. The resulting series—1, 4, 9, 16, 25, 36, 49, etc.—contains of course alternating odd numbers, but the even numbers in it are themselves the result of the addition of two odd numbers (as 4 is constituted from 1+3 and 16 from 9+7 and 36 from 25+11). Viewed as multiples, the series is identical with the series of the square numbers. Hence a number such as 16 can be seen as the result either of multiplication (4x4) or of "equilateral" addition (9+7), the latter being primary for Ficino and the Pythagorean tradition.

9. That is, whereas 1 is the leader of all odd numbers and of some even numbers (i.e., of those in the series produced by equilateral addition as just

described), 2 is the leader of the even numbers produced by unequilateral addition (which Ficino is about to describe).

10. Cf. Theon, *Expositio* 1.5 (ed. Hiller, p. 22.13–16).

11. On the primary triangles, see *Timaeus* 57D, 58D, 73B, 89C, and, for the notion of a triangle's perfect form, 53C ff. On triangular numbers, cf. Theon, *Expositio* 1.19 (ed. Hiller, pp. 31.13–33.18). The trigon series is 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, etc. Note that occasionally numbers here also appear in the equilateral or the unequilateral series—for instance, 6, 36.

12. Cf. Theon, *Expositio* 1.13 (ed. Hiller, p. 27.8–13).

13. That is, 2x3, 3x4, 4x5, 5x6, etc. Again, the numbers in this unequilateral series are seen from two perspectives: first as the sums of addition, then as the products of multiplication. Ficino finds it significant that the equilateral series had resulted in alternating odd and even numbers; cf. Theon, *Expositio* 1.20 (ed. Hiller, p. 34.1–6).

14. That is, the "long" numbers in the unequilateral series—2, 6, 12, 20, 30, 42, 56, 72, 90, 110, and so on—are always even because they are products of an odd multiplying an even—1x2, 2x3, 3x4, 4x5, 5x6, 6x7, 7x8, 8x9, 9x10, 10x11, and so on. The "oblong" numbers, however, are only two-thirds of them even, namely, when they are products of an even multiplying an even (say 4x6) or of an even multiplying an odd (say 4x7). The remaining one-third are odd, namely, when they are products of an odd multiplying an odd (say 3x7). Hence the distribution of odd and evens in their case is "exceedingly unequal."

15. Theon, *Expositio* 1.32 and 2.42 (ed. Hiller, pp. 46.14–16, 100.13–14), merely says that 3 is also perfect because it is the first number to have a beginning, middle, and end, and is both a line and a surface; cf. the *Theologumena* 14.

16. Cf. the *Theologumena* 2 and 3, which declares that Nicomachus had said that God coincides with the monad. It is a familiar Neoplatonic trope.

17. For the Pythagoreans on 8 as justice, see Macrobius, *In Somnium Scipionis* 1.5.17–18. Significantly it is not in Theon, *Expositio* 2.47 (ed. Hiller, pp. 104.20–106.2), or in the *Theologumena* 72, where we might expect it. Ficino was familiar with Macrobius from the onset of his career.

18. "The odd number" refers, I take it, not to any odd number or even to any one of the three odd numbers just enumerated—3, 7, and 9—but to the 3 alone. The 3 is the prime odd number (and Ficino has so described it in the preceding paragraph), and, as 1–1–1, it can certainly be defined as possessing the bond of itself within, as being circular in a unique way, and as having its extremes agree with its mean. On the other hand, Ficino does not usually think of the 3 as "the principle of the universal order." Indeed, in the opening sentence of chapter 8 below, he will speak of the 1 as the universal cause. Moreover, though the 1 is not strictly speaking an odd number, but the source of all numbers, Ficino will also maintain in that same chapter that Archytas had suggested that the 1 is the Idea of the odd numbers just as the 2 is the Idea of the even, 3 being the first number. The Pythagoreans in general, however, had preferred to think of the 1 as odd and in this special sense the 1 is the archetypal odd, the *impar*.

The Christian doctrine of the Trinity obviously supports an inclusive interpretation of these apparent alternatives.

Chapter 7

1. Cf. Theon, *Expositio* 1.19 (ed. Hiller, pp. 32.22–33.18).

2. *norma* is almost certainly intended in the technical sense again of a workman's straight-edged square or rule used for obtaining right angles, i.e., a constant. Ficino is rendering the Greek *gnômôn*, for which see Theon, *Expositio* 1.23 (ed. Hiller, pp. 37.11–38.15). Cf. chapter 6, par. iii above.

3. That is, 1, 1+2=3, 3+3=6, 6+4=10, 10+5=15, and so on.

4. That is, 1+3=4, 3+6=9, 6+10=16, 10+15=25—the squares respectively of 2, 3, 4, and 5; and so on. Geometrically such squares are seen in terms of their two (four) constituent right-angled isosceles triangles.

5. *Timaeus* 31E, 35A, 43D ff., 53B ff., *Parmenides* 144A, *Republic* 7.529CD, etc. This does not seem to be a reference to the mathematicals.

6. Plotinus, *Enneads* 6.6[34].9–15 (which argues that ideal Numbers are even prior to the Forms), also 5.5[32].4–5. I take the Proclus reference here to be to the doctrine of the henads. This was most accessible to Ficino in Proclus's *Platonic Theology* 3.1–6 (ed. Saffrey and Westerink, 3:5–28) and especially at 3.5; in the *Elements of Theology* 113–165 (ed. E. R. Dodds, 2d ed. [Oxford, 1965], pp. 100–145); and in the *Parmenides* Commentary 6.1043.4–1051.33 (ed. Cousin). He may have first encountered the latter in Moerbeke's Latin rendering; see Carlos Steel's introduction to his recent edition, *Proclus: Commentaire sur le Parménide de Platon, traduction de Guillaume de Moerbeke*, 2 vols. (Louvain and Leiden, 1982–1985), 1:38*–40*.

Chapter 8

1. What is the significance here of *potius* (more) and *potissimum* (mostly)? The odd are seen as "converting" since they have the 1 as their "hinge" and "center." The even "proceed" since 2, the first even, is a "falling away" from the 1. This again speaks to the mysterious Platonic elevation of the odd over the even numbers.

2. A commonplace; e.g., Theon, *Expositio* 1.3 (ed. Hiller, p. 18.3). Note that Ficino is not differentiating here between *unitas* and *unum*.

3. *Apud* Theon, *Expositio* 1.4—Archytas and Philolaus say the monad is the one—and 1.5 (ed. Hiller, pp. 20.19–20, 22.9–16).

4. Cf. Theon, *Expositio* 1.5, 2.42 (ed. Hiller, pp. 22.9–16, 100.13–17).

5. See chapter 5, n. 1 above.

6. Cf. Theon, *Expositio* 1.5 (ed. Hiller, pp. 21.24–22.9).

7. A lost work that Theon cites, *Expositio* 1.5 (ed. Hiller, p. 22.5–6). Cf. Aristotle's own *Metaphysics* Alpha 5.985b23 ff. and esp. 986a19–21, and

Physics Gamma 4.203a10 ff. (Kirk-Raven-Schofield, *Presocratic Philosophers*, nos. 430 and 437, pp. 328–332, 336–337).

8. By the "Pythagoreans" Ficino is probably again thinking specifically either of Archytas, whom Theon in his *Expositio* 1.5 cites immediately after Aristotle's *Pythagorean*, or of both Archytas and Philolaus, whom Theon brackets together as using the one and the monad interchangeably (1.4—see n. 3 above). At 2.49 (ed. Hiller, p. 106.10–11) Theon links them as twin authorities on the decad.

9. What is the significance of *ab initio* here? For 1 as the principle of all numbers, see Theon, *Expositio* 1.3, 4, 7, 19, 23 (the seed), 31 (the principle of all figures); and 2.44 (but not a number itself) (ed. Hiller, pp. 18.6, 19.21, 24.23, 33.5–7, 37.17–19, 43.4–8, 10–11, 102.4). Cf. chapter 5, n. 1 above.

10. Ficino is contrasting the notion of division as a "tearing apart" (*divellere*) with that of "unfolding" (*explicare*). The first suggests the violence with which Osiris, Attis, and Dionysus were variously sundered; see Wind, *Pagan Mysteries*, pp. 133–135, 138, 174 ff. The second is part of a triad—enfolded, unfolding, and folding—which signifies the fundamental Neoplatonic triad of rest, emanation, and return (*monê, proodos, epistrophê*).

11. Again, the Platonic reversal of the customary equation of equality and identity with what is even. As the principle of "the same" and as the "indivisible link" in every odd number, the 1's presence mysteriously elevates the odd numbers over the even.

12. That is, the sums of the equilateral addition sequence 1+3, 4+5, 9+7, and so on—which are the same as the products of the multiplication sequence 2x2, 3x3, 4x4, and so on.

13. Equilaterals have "equality and straightness" in that 4, for instance, is the product of 2x2, whereas an unequilateral like 6 is the product of 2x3. As sums, however, the former originates from the 1, the latter from the 2.

14. "Other," I take it, in the sense that their excellence is not "different from" but "more than" just equality, likeness, and straightness.

15. In that the equilateral sequence begins with 1. Again cf. Theon, *Expositio* 1.23 (ed. Hiller, p. 37.17–18), on unity as the "seed" of all numbers.

16. *dum in sua permanet vel geminat unitate* is a difficult clause. I take it to mean that since the 1 as seed is enduring, it can remain in its own unity as 1x1 and yet double as 1+1 to 2. We might be tempted to emend to *germinat*.

17. That is, the seed of an unequilateral like 6 can be thought of as being either of its factors 2 or 3; there is no enduring seed, no 1. Note the emendation. The YMZ reading *quadratum* is impossible.

18. That is, instead of 2 (the author) multiplying 4 (the instrument), the 2 can multiply itself twice; and similarly with the 3.

19. That is, without the instrumentality of the angels or of the angel who is Neoplatonically equated with Mind, the prime creature.

20. I cannot locate the source of this Pythagorean dictum. Perhaps it is derived from various comments by Aristotle in his account of the Pythagoreans in the *Metaphysics* 1.5.985b23 ff. (cf. n. 7 above).

21. Cf. chapter 6, n. 18 above.

Chapter 9

1. As elsewhere, "compounded" and "procreated" mean "added."

2. That is, 12, an unequilateral, is enclosed on either side by two equilaterals, 16 and 9. In other words, the unequilateral is the proportional mean between the two equilaterals, and 16:12:9 is entirely governed by the ratio of 4:3. Cf. Theon, *Expositio* 1.16 (ed. Hiller, pp. 28.16–30.7).

3. That is, the next "enclosings" of unequilaterals by equilaterals are: 25:20:16 (governed by the ratio of 5:4), 36:30:25 (governed by the ratio of 6:5), 49:42:36 (governed by the ratio of 7:6), and so on. But Ficino is only interested in the ratios of 4:3, 3:2, and 2:1 because they are contained in the number 12.

4. *Epinomis* epitome (*Opera*, pp. 1529–1530); see Part One, Chapter 1 above. The reference to the epitomes for the *Laws* is obscure since the issue of proportions is not addressed in them, unless Ficino is thinking of his discussion of twelve(s) in his epitomes for *Laws* 5, 6, and 12 (*Opera*, pp. 1502, 1504–1505, 1522.2 ff.). The more probable reference is to his epitomes for other books of the *Republic* and especially that for book 10 (*Opera*, pp. 1433 ff.).

Chapter 10

1. That is, if we think of 8 as a square and not as a cube, then its root is unknown.

2. That is, the diagonal cannot be measured. To square a number is to raise it to a higher power and thus to treat of its potentiality, while to determine the root of such a square is to arrive at its act. Similarly, to square a number is to treat it as a plane, to determine the root of such a square is to treat it as a line.

3. Note the extended metaphor.

Chapter 11

1. Ten is not a "long" unequilateral like 6 but an "oblong." It is also of course a trigon. Ficino is skating over some complications here; see Part One, Chapter 2, pp. 55–56 above.

2. The unequilateral sequence, we recall, consists of: 2, 6, 12, 20, 30, 42, 56, 72, and so on. Neither 24 nor 54 is in this series, which consists only of long numbers, i.e., those which, from the perspective of multiplication, are the products of two factors differing only by 1 (as 12 of 3x4 or 72 of 8x9). Rather, they are oblongs, the products that is of two factors differing by more than 1: of 4x6 (or 12x2 or 3x8) and of 6x9 (or 3x18 or 2x27) respectively.

3. Sixty-four is a solid insofar as it is the product of 4x4x4, and 216 is a solid insofar as it is the product of 6x6x6. Ficino is referring throughout to cubes.

Chapter 12

1. Cf. *Phaedrus* 243E–257A, *Timaeus* 69C–72D, *Republic* 4.435B–442D, 9.580D ff, 581C, 588C–590C—Plato's major treatments of the soul's tripartition.

2. Meaning, I take it, that if we opt for contemplative, saturnian men as contrasted with active, jovian men. The only difference between these two ideal kinds, as Ficino goes on to declare, is the relationship in them between the understanding (*intelligentia*) and the reason (*ratio*). Both need *disciplina*, that is, instruction.

3. Notice that air, not fire, predominates in the sanguineous spirit (for which see Ficino's *De Vita* passim, and especially 1.2). For the ordinary ratios among the simple elements, see Theon, *Expositio* 2.38 (ed. Hiller, p. 97.4–12) on the fourth quaternary: fire:air is as 1:2, fire:water as 1:3, fire:earth as 1:4, air:water as 2:3, and water:earth as 3:4. The ratios derive from Plato's enigmatic account in the *Timaeus* at 57D, 58D, 73B, 89C of the various kinds of triangle constituting the elements; cf. chapter 6, n. 11 above.

4. Cf. *De Vita* 3.12.16–22 (ed. Kaske and Clark).

5. For the notion that heat is a "form" for wetness, again cf. Ficino's *De Vita* 3.12.20–21, 25–26 (ed. Kaske and Clark) on the dominance of heat in tempering the moisture in our "complexion"; also his *Timaeus* Commentary 17 (*Opera*, p. 144[5]) where fire is compared to form and earth with matter.

6. *Opera*, pp. 1529–1530. See Part One, Chapter 4, pp. 110–112 and n. 15 above.

7. *De Vita* 3.5, 6, 11, 21, 22. Cf. Macrobius, *In Somnium Scipionis* 2.3.14.

8. For these four planets as "the fountains of life," see chapter 3, n. 20 above. Note that Jupiter predominates here, not the Sun.

9. For the astrological theory of elections, see Garin, "Le 'elezioni' e il problema dell'astrologia"; idem, *Lo zodiaco*, chapter 2. Cf. Ficino's *De Vita* 3.12.117 ff., 25.9–15 (ed. Kaske and Clark).

10. What does *dirigenda* mean here?

11. A key term, see Part One, Chapter 3 above.

12. In the twin senses of being instructed and being in control. Undermining discipline are "negligence" and "imprudence," and even just "infelicity."

13. The *fatalis ordo* is not the thread of personal identity spun by the three Fates as in Hesiod's *Theogony* 217–222, 904–906, and above all, for Ficino, in Plato's *Republic* 10.617C ff. Rather it is the great order of Necessity itself as described in the *Republic* 10.616C and 617B. In his epitome (*Opera*, p. 1438), Ficino speaks of the *fatum commune*, however, and identifies it with providence. He has an important chapter on Fate in his *Timaeus* Commentary, summa 25 (*Opera*, pp. 1670–71). Cf. chapter 15, n. 5 below.

14. *Politics* 5.12.1316a3–11 (cf. the translation by Benjamin Jowett in the Bollingen Aristotle, 2:2089). See Part One, Chapter 1, n. 19 above.

15. What does Ficino intend by his second alternative? For he proceeds to ignore it.

16. That is, the harmonies of the fourth and the fifth, both of which are contained in the diapason, as we have seen.

Chapter 13

1. Presumably Ficino is thinking of the view expounded in the *Republic* itself.

2. The reference to Pythagoras is obscure, though that to Plato is presumably to the *Republic* 8.546A ff. The Iamblichus reference may be to the *De vita Pythagorica* 27.130–131, or possibly to the *In Nicomachi Arith. Introd.* 82.20–83.18 (which refers to the *Republic* 8.546). The Boethius reference is probably to the *De Institutione Arithmetica* in general, but we might note that the one allusion to the *Republic* there is in fact to the passage on the nuptial number and occurs at 2.46 (ed. Friedlein, p. 151.22–25). See Part One, Chapter 1, pp. 32–35 above.

3. This would seem to be implying that the parents on both sides should be odd, notwithstanding the fact that adjacent odd and even numbers constitute the spousal numbers. Perhaps *parentes* means "progenitors" generally.

4. The diapason is not exactly united with but rather contains the diapente and the diatesseron. See chapter 12, n. 16 above.

5. An obscure reference, probably to another part of this treatise.

6. What is the "praiseworthy" or "excellent" number and what is its "opposite"?

Since the following sentence says the "excellent" number is "fecund," Ficino would seem to be referring either to an "abundant" number—in all likelihood to 1728 as 12 cubed—or to a perfect number—perhaps to 36,000 as the term of the Platonic year. However, he has just declared that 1728 is a fatal number that can produce either good or bad progeny; and in chapters 14 and 15 below he will call it a "great" but not an "excellent" number!

The "opposite" of the "praiseworthy" number is even less clear, but, given its sterility, it must refer either to a deficient or to an exceedingly imperfect number such as an oblong unequilateral.

7. Notice the traditional distinction between *opportunitas* for a favorable moment in time, *occasio* for an unfavorable.

Chapter 14

1. *Republic* 9.587D–588A. Ficino's epitome is silent on 729 and says merely, "Inter haec, casu quodam nescio, quid interserit mathematicum, cuius declarationem ex commentariis in *Timaeum* accipies opportunius" (*Opera*, p. 1427). But the chapters dealing with mathematics in his *Timaeus* Commentary do not refer to 729 so far as I can determine.

2. "Solid" because the product of 9x9x9, and "circular" because 729 circles back to 9 in that it and 9 both end in 9.

3. In that there are nine celestial spheres: those of the seven planets, that of the fixed stars, and that of the primum mobile.

4. That is, in the course of expounding the myth of Er at 615A ff.; cf. Ficino's epitome (*Opera*, pp. 1431–1432).

Ficino finds it significant that Plato had treated of a number ending in 8 in book 8, of a number ending in 9 in book 9, and of a number "procreated" from 10 in book 10. Or at least, he suspects that a Platonist cannot afford to overlook such congruences.

5. *Phaedrus* 248E ff.; see Ficino's *Phaedrus* Commentary, summa 25 (ed. Allen, pp. 168–171), with my analysis in *Platonism*, pp. 177–178. Cf. chapter 15, n. 7 below.

6. This clause is ambiguous: "it" as the subject might also refer to "either square" or possibly to "1728." But Ficino is about to explain Plato's triple mention of 100 in his description of the fatal number.

7. This crux presents difficulties and "only" and "besides" should be omitted. For 728 is oblong in the sense that it is the product, for instance, of 8x91 or 7x104 or 14x52 or 28x26; but it is not long, because it is not the product of two factors differing only by 1. The same is true of 700 as Ficino goes on to explain. Chapter 15, par. i, below refers to "that unequilateral and oblong number, namely 728."

8. The argument of the rest of this paragraph is difficult. In chapter 5 above, Ficino had adduced squares with rational diagonals of 3, 7, 17, and so on. But such values are not part of the equilateral series (4, 9, 16, 25, 49, 64, and so on) unless they are themselves squared. Here he must be thinking therefore, not of rational diagonals as such, but rather of their "powers" or squares—that is, of 9, 49, 289, and so on. Thus he interprets Plato's "twin" 100's to mean a hundred squares (including such diagonal powers) and a hundred cubes. See Part One, Chapter 2, pp. 76–79 above.

9. I.e., to 10,000. The myriad is the "numberless crowd," given that *murias* in Greek means both "ten thousand" and more generally "a countless number."

10. I.e., up to the myriad. Ficino is not saying that the powers of certain rational diagonals—powers such as 9, 49, 289, and so on—are a myriad, but merely that they are included in it. Indeed, in chapter 15, par. v, he will hint that the number of such powers so included is 100.

11. Meaning, presumably, if you cube existing cubes, for instance, 27x27.

12. I take this to mean that, while the limit for squares (including the diagonal powers) is 100^2, the limit for cubes is 100^3, the million not the myriad. But the operative root for both remains the 100 (which in turn has as its own root the 10).

13. That is, subsequent to the eighth celestial sphere of the fixed stars.

14. I doubt Ficino has the specific ratio of 1000:28 (i.e., 250:7) in mind.

15. That is, to the six other planets. The specific ratio of 700:28 (i.e., 25:1) is again probably not what Ficino intended.

16. Ficino is thinking of the six higher planets as a group. What does he mean by "a similar proportion" here between the elemental wetness and the Moon, between the Moon and the planets, and between the planets and the firmament? Clearly he no longer has the musical intervals of the *Epinomis* in mind as in chapter 12 above.

17. Ficino must mean here both all even numbers and all the numbers in the equilateral series of 4, 9, 16, 25, and so on (half of which are odd)! He cannot mean all even numbers but especially the equilateral numbers that are even, since he goes on to link the unequilateral series, none of which are odd, with the odd numbers.

18. That is, all odd numbers (and not just the odd numbers in the equilateral series) plus the numbers in the unequilateral series of 6, 12, 20, 30, and so on (all of which are even)! The point seems to be to contrast generally all even with all odd numbers, and then more specifically all the numbers (odd and even) in the equilateral series with all those in the unequilateral (all of which are even). He does not intend to reconcile the two categories.

In the next paragraph, Ficino will distribute the plane and solid, lateral and diagonal numbers among the planets.

19. "Oblongs" mean, we recall, those numbers having factors differing by more than 1, e.g., 15=3x5. Ficino observes below that both odd and even numbers can be predicated of the planets, depending on the point of view.

20. He has already just assigned the equilateral numbers to the firmament, and the unequilaterals (i.e., the longs) to the planets and the elements. Now he is subdividing the latter category and designating as oblongs the three planets and the two elements that are subject to the most motion.

21. The "great spheres" of the planets as contrasted with the lesser spheres of the elements.

22. That is, if we are comparing the planets with the elements, then we can think of all of them as even, but within the planets as a category evenness is associated with the Sun, Jupiter, and Venus and oddness with the Moon, Mercury, and Mars. Similarly, within the elements as a category evenness is associated with the upper aethereal air and with the middle air, whereas oddness is associated with fire and with water. Interestingly, Ficino avoids mentioning both Saturn and Earth/earth in these comparative distributions that are now privileging the even.

23. Ficino now proceeds to subdivide the planets in terms of plane and solid and to privilege the solid.

24. In other words, the Moon, Mercury, Venus, and Mars are subordinate planets that "refer" to, in the sense of "answer" to, the solidity, the "fullness" of the other three. See n. 28 below.

25. *Cratylus* 396AB: "Wherefore we are right in calling Jupiter Zena and Dia, which are one name, although divided, meaning the god through whom all creatures always have life" ("*di' hon zên aei pasi tois zôsin huparchei*"—396B1–2). Plato derives *Cronos* from *Koros* as signifying "the pure and garnished mind" ("*to katharon autou kai akêraton tou nou*"—396B6–7). Cf. Ficino's *Cratylus* epitome (*Opera*, p. 1311).

26. *Laws* 4.713A: "the god who is the master of rational man."

27. The "ingenious gift" means the powers that Saturn bestows on our intellect, on our *ingenium*.

28. Note that the "solid" Sun has two ministering "plane" planets, while Jupiter and Saturn each have only one. The link between Jupiter and Venus is especially significant for Ficino given Plotinus's suggestion that "priests and

theologians" have identified the higher Venus not only with Juno but with Zeus. Venus can thus signify the World-Soul; cf. *Enneads* 3.5.2.15–20, 3.5.8.20–24, 5.8.13.16–18. See my *Platonism*, pp. 130–132.

29. That is, the Moon is the diagonal to Venus's side since she is "bearing" (i.e., duplicating) the "power" of Venus's side.

30. The importance of such metaphors is stressed in the *Timaeus* at 27CD, 29D, and in the *Phaedrus* at 246A, 257A.

31. *De Vita* 3.23–25.

Chapter 15

1. That is, having focused on the last three digits in 1728.

2. That is, this second or diagonal 100 is the number "of equal length" which multiplies the number sacred to Pallas, the 7, to give us the 700 in the great number 1728. In the parentheses I take Ficino to be saying that this 100 can be viewed either as an integer (*pariter*) or as the product of 10^2 (*planum*).

3. In short, Ficino is extracting the 100 thrice: as the square root of 10,000 (the myriad being the hundredth square); as 10^2; and as the cube root of 1,000,000 (the million being the hundredth cube). The passage is difficult. Ficino will be arguing almost immediately that Plato also "secretly" intends 10,000 here.

4. That is, the three as triply present: in the three 100's; in the threesome of 100, 1000, and 10,000; and in the three terms in 1728 (i.e., 1000, 700, and 28).

5. For this Platonic allegorization of the Fates see *Republic* 10.617C and Ficino's epitome (*Opera*, pp. 1434–35); see too his epitome for *Laws* 12 (*Opera*, p. 1525), and his *De Vita* 2.20.57–62 (ed. Kaske and Clark). Cf. chapter 12, n. 13 above.

6. *Republic* 10.615AB. Cf. Ficino's epitome: "si ad centum usque vixissent annos, quo termino vita hominum quodammodo designatur" (*Opera*, p. 1432).

7. *Phaedrus* 248E–249B. Cf. Ficino's *Phaedrus* Commentary, summa 25 (ed. Allen, p. 169), and his *Republic* 10 epitome (*Opera*, p. 1432). See my *Platonism*, pp. 177–179. Cf. chapter 14, n. 5 above.

8. The myriad has "equal" dignity as 100x100, but "unequal" dignity as 10x1000. The two references are I believe to the "secret" presence of 10,000 here in the *Republic* 8 at 546C, and again in the *Phaedrus* at 248E; cf. n. 21 below. Ficino's *Phaedrus* Commentary, summa 25 (ed. Allen, pp. 168–170) declares that 10,000 signifies the "slowness" with which men return to their native land.

9. That is, if we cube every number from 1 to 100, the hundredth in the resulting cubes is the million.

10. Citing Plato's phrase at 546C6, "*hekaton de kubôn triados.*"

11. In the earlier instance 10 is taken as the line, in the later instance 100—with the resulting adjustments. Ficino sees Plato concentrating upon

100 as the basic number of time: it is the marker of the centuries, of both the planes and the depths, as it were, of time. Cf. his *Republic* 10 epitome (*Opera*, p. 1432).

12. Citing the phrase at 546C3, "*tên men isên isakis, hekaton* (var. *hekaston*) *tosautakis.*"

13. I.e., through the territory of the "innumerable planes" and powers below 10,000 (see n. 3 above) or possibly between 10,000 and a million. The diagonal numbers, we recall, are often thought of in terms of their "powers" and thus as planes.

14. This famous phrase is repeated in chapter 16.16 below.

15. The referent is not clear, but I take *haec omnia* to be referring to the "planes and solids." Cf. *Timaeus* 32AB, 53C–56A and its description (based on the assumption that every rectilinear surface is made up of triangles) of the mix of the five regular solid figures that underlie both celestial and terrestrial matter.

16. Again the referent is not clear—the *quorum* could be referring to the preceding *haec omnia* (and thus, if I am correct there, to the "planes and solids"). However, I take it to be referring directly to "the celestials and the elements" because of the idea of motion. In either case, Ficino's meaning is obvious: plane and solid numbers can be said to underlie celestials and terrestrials and to endow them with their powers and motions.

17. In the sense of "began" or more literally in the sense of "drew out of"? Ficino may be playing on the subtle distinction between *producere* and the *deducere* of the next line.

18. Six is the first perfect number, we recall, because it is the first to equal the sum of its factors of 3, 2, and 1.

19. That is, since 2 and 8 are the last two digits in the fatal number of 1728, 28 is the "terminus," meaning the end and limit of that number. Just as 12 (as 2x6) was its "entrance," so is 28 its "exit."

20. There is no one "great" number: "great" is used of 1728 at the beginning of this paragraph, of 10,000 at the end.

21. The rest of this paragraph is difficult. The "innumerable number" has been equated elsewhere with the 10,000, and Ficino seems to be saying that it (as well as the 100) is secretly presented here by Plato, and presented in three guises (3 being the first and "most sacred" of all numbers): as 100^2; as the number containing 100 diagonal and therefore 100 lateral powers; and as the principal factor, along with the 100, of a million. Cf. n. 8 above.

22. That is, he presents 10,000 as 100^2 (i.e., in terms of its "equal dignity").

23. The formula for "arranging" and "increasing" these numbers has been given in chapter 5 above.

24. Meaning, I take it, the diagonal powers (squares) that we derive from the lateral powers (squares) as 7^2 from 5^2+5^2-1; that is, as chapter 5 has already argued, the creation of larger square numbers from smaller.

25. The 10,000 as 100^2 is multiplied by 100 again to produce the cube, the million. The square is therefore present in the cube and the million is the hundredth, the "amplest" cube. See n. 9 above.

26. Ficino seems to be arguing that all compounded, all sublunar things cannot outlast 10,000 years.

27. That is, individual things, given the transitoriness of their constituent triangles, have their own spans (which are much smaller than 10,000). Cf. *Timaeus* 89C (on individuals and diseases).

28. The "certain parts" of "such a great number" I take to be referring to the parts of 10,000, namely to 10, 100, and 1000 as its factors, but Ficino may be thinking of 1728 and its "parts," namely of 1000, 700, and 28.

Chapter 16

1. *Statesman* 309A ff., 309E–311A; *Laws* 4.721A.ff., 6.772D–773E, 775B–E, 783D–785B; cf. 5.735B ff.

2. A crux: *aequalissima* could qualify the distant preceding *ingenia* or the immediately preceding *progenies* or the succeeding *utraque vero ingenia*. The sense demands, I believe, the latter and I have punctuated and translated accordingly. The two different dispositions should each be the "most tempered" (cf. a few lines below where the diapason is likewise described as "most equal," meaning "most tempered") and the most "elect" in their class, but expressly not "most equal" to each other. In chapter 17 below, at the end of par. vii, he will call the divine class of perfect numbers "equal and tempered," since it "depends on, and stands firm in, its parts and powers."

3. The "higher wetness" refers here to air, which is warm and moist, the "lower wetness" to water, which is cold and moist, fire being hot and dry, earth cold and dry. Cf. Ficino's *Timaeus* Commentary 17 (*Opera*, p. 144[5].1), which defines *humor* as *ignis terraeque conciliator* and then subdivides it into *igneus*, *terreus*, and *aer purus*, *humor terreus* being ordinary water and *humor igneus* being aether Platonically conceived as intermediate between the pure air and the pure fire (see the *Epinomis* 981C, 984B–E).

4. Cf. chapter 3, n. 7 above.

5. I have introduced the semicolon after *imparibus* to make it clear that *velut in quadratis numeris* should not govern *inaequales autem ex paribus*. For Ficino simply means, I take it, that even habits are like the square numbers (i.e., 4, 9, 16, 25, and so on) generated in the equilateral addition series from the odd numbers, whereas odd habits are like the non-square numbers generated in the unequilateral series from the even numbers. He cannot mean that odd habits are like the odd sums in the equilateral series (where they could be said to be generated from an even number only in that any alternate sum in the series is necessarily even—1+3=4, 4+5=9, 9+7=16, 16+9=25, and so on—and that the next odd number is added to it). See Part One, Chapter 3, pp. 85–86 above.

6. Note that these are the life-giving planets; cf. chapter 3, n. 20 above.

7. Ficino may be referring not to Plato's portrait of a republic but to the *Republic* itself at 5.458E ff., 459E, 460E–461B, or 8.546A ff.

8. *Laws* 6.771E ff., 772D–773D, 775C–E (and esp. 773A–D).

9. *Laws* 6.773CD.

10. Since 35 itself must be the oblong (as 5x7)—see chapter 6, par. i above—what is the long that Plato "explicitly" intends here? I believe Ficino must be thinking of 30 (which as 5x6 is a long), because, as the opening sentence of this paragraph has already declared (following the *Laws* 6.772DE), a man should enter upon marriage between 25 and 35, the arithmetic mean of which is 30. Furthermore, as the next paragraph is about to declare (following the *Republic* 5.460E), a man's time for begetting lasts from 30 (his prime) to 55, a period of 25 years (30 is also the mean age for a woman to give birth). Perhaps we should simply emend the text to read *Denique ubi inducit 30 et 35.*

11. That is, Ficino sees Plato intending by his introduction of 35 to suggest not only 30 but also 36. For 36 is the nearest circular to 35 and also the nearest power or square to it in the equilateral series; 36 is thus the "term" of 35.

12. *Republic* 5.454–463 (and esp. 460E); cf. *Laws* 6.772D.

Chapter 17

1. This is actually the Porphyrian order, since the strictly Platonic order, as derived from the *Timaeus* 38C–E, reverses the positions of Mercury and Venus, though Ficino probably thought of them as identical. The principal contrasting order for him is the Chaldaean-Ptolemaic: Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon, an order he usually adheres to in nonastronomical contexts given its well-nigh universal acceptance during the Middle Ages; cf. Ficino's *Timaeus* Commentary 35 (*Opera*, p. 1461). See my *Platonism*, p. 118, n. 17, with further details.

2. In the following paragraph Ficino mentions "the rest" of the perfect numbers and this suggests he had envisaged those beyond 8128. See Part One, Chapter 2, nn. 20, 22 above.

3. Ficino is intrigued by the fact that the last digits in the sequence of the first four perfect numbers—6, 28, 496, 8128—alternate between 6 and 8 and supposes this true for higher perfect numbers. Again see Part One, Chapter 2, nn. 21, 22 above.

4. That is, in terms of its being a square or cube root.

5. Book 3 of the *De Vita* in particular is concerned with the problem of how to "capture" the astrologically auspicious moment, the moment best suited to our character, our *ingenium*, our inner and outer daemons and their powers. In particular see 3.23.1–17 (ed. Kaske and Clark).

6. Cf. *De Vita* 3.5 and 3.19.54–58 ff. (ed. Kaske and Clark).

7. The subject of *quando nobiscum ita consonat* is unclear. It could mean: "when Jupiter accords with us thus" or more probably "when the whole harmony of all seven planets accords with us thus" (there being six intervals between them). "Celestials" always refers to the planets, not to the stars in the firmament.

8. Cf. Ficino's epitome for *Laws* 4 (*Opera*, p. 1498).

9. Cf. *De Vita* 3.22.33-44 (ed. Kaske and Clark), where Jupiter is described as "the temperer" of Saturn.

10. Cf. *De Vita* 3.4.66–68 (ed. Kaske and Clark), where the sextile aspect is defined as being the time when two planets are two signs away from each other, the trine aspect when they are four.

11. One of the senses of *affectio* is "planetary aspect" and Ficino is playing off this.

12. That is, the Moon serves to temper the Sun as Jupiter tempers all things. I take *agit* here to imply that the Moon "acts the part" of Jupiter.

13. Meaning at the time of conjunction? Cf. *De Vita* 3.6.102–106, 18.89–91 (ed. Kaske and Clark).

14. Cf. *De Vita* 3.6.115–123 (ed. Kaske and Clark).

15. For Venus as a lesser Jupiter, again cf. Plotinus, *Enneads* 3.5.8 and 5.8.13. Notice that Ficino is once more focusing on the life-giving planets.

16. In the last paragraph of chapter 14 above, Ficino had already described Mercury as moving with "the ingenious gift" of Saturn, or accompanying or executing it. Cf. his letter to Filippo Carducci of 14 November 1492:

> Mercurio Saturnum insuper addidi sive comitem sive ducem. Lego hodie in X de *Republica* Mercurium Saturnumque colore, id est luce, ita consimiles esse ut alter quidem ad sapientiam exhortetur, alter vero, Deo videlicet altius aspirante, perducat. Dei quidem imaginem esse Solem volunt. Deus ipse est auctor sapientiae primus. Sapientiae significatores, Mercurius atque Saturnus, imaginis divinae comites minime omnium a Sole discedunt, dum videlicet et Mercurius sub Solis splendore ferme semper incedit, et Saturnus ab eclyptica Solis via minime omnium praevaricari videtur. Hos astronomi natura quadam similes esse putant Mercuriumque aedibus et finibus et aspectu Saturni gaudere. Hic (ut opinor) efficitur ut ferme omnes qui a Mercurio suum iter professionemque exordiuntur solum desinant in Saturnum. (*Opera*, p. 948.3)

Cf. also his *De Vita* 1.4.1–9 (ed. Kaske and Clark).

17. Compare, for instance, Ficino's epitome for *Laws* 4 (*Opera*, p. 1498) on "the reign of Saturn," and his *De Vita* 3.22.45 ff. (ed. Kaske and Clark).

18. *in quos fines seculorum pervenerunt* may also imply that the ends of the ages were perfected in and by the coming of such divine men. Ficino probably has in mind Plato's references to the "shepherds" in the *Statesman*'s great myth at 271D ff. and 275B ff.; cf. his epitome for that dialogue (*Opera*, p. 1296), and an unattached chapter of his *Philebus* Commentary (ed. Allen, p. 435).

19. Vergil, *Eclogues* 4.4–7 (with the omission of line 6). Ficino occasionally quoted, paraphrased, or adapted this text; see, for instance, his letter of 6 January 1482 (n.s.) to Duke Federico of Urbino in the seventh book of his *Epistulae*: "Quum etiam Sibylla Cumaea tempore eadem descripsisse videtur, quibus magnus ab integro seculorum nasceretur ordo ac floreret virgo novaque progenies ex alto demitteretur" (*Opera*, p. 852.2).

20. Wisdom of Solomon 11.20[21]. See Appendix 3 below.

21. Cf. the *Expositio* prefacing the *De Numero Fatali*: "sermonem vero hominibus inexplicabilem merito Musis attribuit." It is "inexplicable" because "inextricable."

Appendix 1
Ficino's Greek Exemplar

For his Greek text of 546A1–D3 Ficino undoubtedly used the Laurenziana's 85.9, fols. 253v.12up-254r.2—for which see Part One, Chapter 1, n. 39 above—and that is what is transcribed here. The following variants—substantive and accidental—from Burnet's Oxford edition should be noted: *ksustăsan* (546A1), *ksústasis* (A3), *ménei* (A3), *zôois* (A5), *àphthoría* (A5), *ksunáptôsi* (A6), *hêmetérou* (A8), *genêtõi* (B3; cf. *Timaeus* 34B), *mèn, tẽi promékei dè* (C4), *duẽin* (C5), *ksúmpas* (C6), *sunoikízôsi* (D1), *kairòn* (D2)—I cannot determine whether the reading at C5 is *pempádos* (more likely) or *pempádôn*.

In his great 1830–1831 edition of the *Republic* (consisting of three volumes in two), C. E. C. Schneider gave the collation of MS. 85.9 (using the siglum *Flor. C*), a collation that De Furia had made earlier for G. Stallbaum's 1825 edition. However, even in this brief extract we can see that De Furia had failed to note the variants at B3 and C4, and to credit the MS with *paréchetai* at C2 (according to Boter, *Textual Tradition*, p. 3, he was "a rather careless collator"). Schneider's text refers on occasion to Ficino's 1484–1491 rendering.

I have reproduced Burnet's line numbering.

A Χαλεπὸν μὲν κινηθῆναι πόλιν οὕτω ξυστᾶσαν·
ἀλλ’ ἐπεὶ γενομένῳ παντὶ φθορά ἐστιν, οὐδ’ ἡ τοιαύτη
ξύστασις τὸν ἅπαντα μένει χρόνον, ἀλλὰ λυθήσεται. λύσις
δὲ ἥδε· οὐ μόνον φυτοῖς ἐγγείοις, ἀλλὰ καὶ ἐν ἐπιγείοις
ζώοις φορὰ καὶ ἀφθορία ψυχῆς τε καὶ σωμάτων γίγνονται,
ὅταν περιτροπαὶ ἑκάστοις κύκλων περιφορὰς ξυνάπτωσι,
βραχυβίοις μὲν βραχυπόρους, ἐναντίοις δὲ ἐναντίας. γένους
δὲ ἡμετέρου εὐγονίας τὲ καὶ ἀφορίας καίπερ ὄντες σοφοί,
B οὓς ἡγεμόνας πόλεως ἐπαιδεύσασθε, οὐδὲν μᾶλλον λογισμῷ
μετ’ αἰσθήσεως τεύξονται, ἀλλὰ πάρεισιν αὐτούς, καὶ γεν-
νήσουσι παῖδάς ποτε οὐ δέον. ἔστι δὲ θείῳ μὲν γενητῷ
περίοδος ἣν ἀριθμὸς περιλαμβάνει τέλειος, ἀνθρωπείῳ δὲ
ἐν ᾧ πρώτῳ αὐξήσεις δυνάμεναί τε καὶ δυναστευόμεναι τρεῖς
ἀποστάσεις, τέτταρας δὲ ὅρους λαβοῦσαι ὁμοιούντων τε καὶ
ἀνομοιούντων καὶ αὐξόντων καὶ φθινόντων, πάντα προσήγορα
C καὶ ῥητὰ πρὸς ἄλληλα ἀπέφηναν· ὧν ἐπίτριτος πυθμὴν
πεμπάδι συζυγεὶς δύο ἁρμονίας παρέχεται τρὶς αὐξηθείς,
τὴν μὲν ἴσην ἰσάκις, ἑκατὸν τοσαυτάκις, τὴν δὲ ἰσομήκη
μέν, τῇ προμήκει δέ, ἑκατὸν μὲν ἀριθμῶν ἀπὸ διαμέτρων
ῥητῶν πεμπάδος, δεομένων ἑνὸς ἑκάστων, ἀρρήτων δὲ δυεῖν,
ἑκατὸν δὲ κύβων τριάδος. ξύμπας δὲ οὗτος ἀριθμὸς γεω-
μετρικός, τοιούτου κύριος, ἀμεινόνων τὲ καὶ χειρόνων γε-
D νέσεων· ἃς ὅταν ἀγνοήσαντες ὑμῖν οἱ φύλακες συνοικίζωσι
νύμφας νυμφίοις παρὰ καιρόν, οὐκ εὐφυεῖς οὐδ’ εὐτυχεῖς
παῖδες ἔσονται·